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Manufacturers Record

Reg. U. S. Patent Office

South Benefits from Lowered Steel Prices

Probably the most important news of the month, referred to elsewhere in this issue, is the decision of the United States Steel Corporation, followed by independent steel manufacturers, to reduce prices of finished and semi-finished steel.

Its far-reaching significance to Southern industry lies in the fact that for the first time Birmingham quotations are on a parity with Pittsburgh and Chicago and other centers. The benefit to the industrial South at once will be seen.

Railroads, the construction industry and others will find in this price reduction the spur to greater activity. Steel, always regarded as an accurate gauge of business conditions, is closely watched by industry generally, and the opinion is that the South as a whole, which has made definitely better progress during the depression than other sections, will move forward to increased activity.

JULY, 1938





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**JULY
1938**

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MANUFACTURERS RECORD

Devoted to the Upbuilding of the
Nation Through the Development
of the South and Southwest as the
Nation's Greatest Material Asset

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EDITORIALS

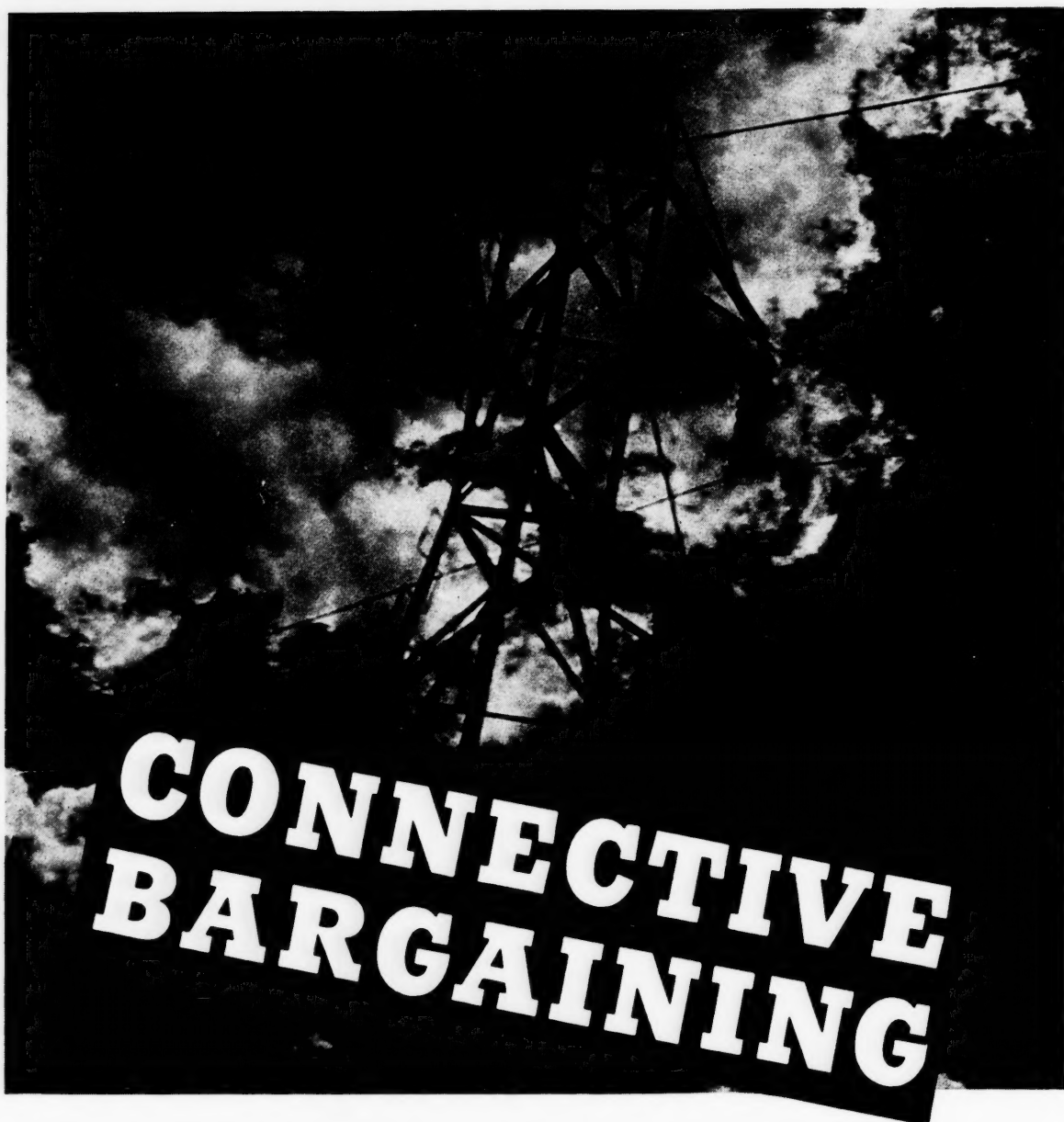
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CONNECTIVE BARGAINING

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"Our ECONOMIC SYSTEM"—Whose?

"ALL these things together I call our program for the national defense of our economic system."

This came in the fireside chat of June 24 after listing what the President was pleased to term "the achievements of Congress."

The economic system which the "program" is said to defend, is not an economic system which the self supporting, self respecting people of the country will cheerfully approve. On the contrary, it is a medley of ideas for which there is no proof of soundness in experience or results, that has been imposed on the country by theorists who see no way out of the depression save by more and more government control and by colossal spending regardless of a mountain of debt growing in size.

The real American economic system, under which our progress of the past was made, found investors and industrialists willing to take risks which they are not willing to take under the new system, and yet such venture money backing individual initiative accounted in large degree for the development of the country. American progress, which has been the envy of the world, has not come about through the type of inexperienced administrators we have had in Washington who build up class hatred and spend billions of dollars of taxpayers' money, regardless of results.

The intelligent sentiment of the country opposes an economic system that fosters and perpetuates a pauper class; promotes government competition to the hurt of private industry; destroys crops and livestock when people are hungry; encourages by silence sit-down strikes; fathers a labor relation act that cries aloud for revision because of its one-sided, prejudiced provisions; sets up bureaus and commissions with resulting confusion of

ideas and objectives beyond anything of the past; centralizes power in Washington; does away with States' rights, and would pack the Supreme Court.

Calling those who disagree copperheads, economic royalists or princes of privilege, may be a part of the system that is being defended, but it gets nowhere except to promote class antagonism while the country is in the midst of a crisis.

Nor is the so called system one that conservative, democratic members of Congress accept as theirs. There are able men of the South and elsewhere in Congress who must defend their records against administration opposition as they come up for reelection because they have dared to oppose even a part of a system they know is wrong and hurtful to the country.

There was an economic system outlined in the Democratic platform of 1932 on which the President was elected. It was a system that over and over again in his speeches he held as necessary to put America back on the road to prosperity. That platform which he accepted provided for economy in government, the abolishment of useless bureaus, and adherence to a policy of thrift to restore confidence in government.

We have been moved so far from the old moorings that it is plain why business lacks confidence and is afraid of what may yet come. To think of that state of mind as being born of greed while business remains stagnant, is nonsense. Industry wants to move ahead and wants to occupy itself with supplying the things the country needs, and for which demand is afraid to express itself. Why is it held back? Why don't people buy freely and invest with confidence? The answer is plain. People fear that having lost our anchorage we are drifting toward rapids that may wreck the boat.

As we see it—

Southern Progress During Depression

The Blue Book of Southern Progress, which has just been issued, contains in its facts and figures a story of the progress of the South in depression time, which is inspiring and in marked contrast with the record made in other sections. The development of the South means the enrichment of the nation, and the Blue Book shows the advance that is taking place in the development of resources and the creation of new wealth. Money spent by privately owned industry for new work, the wider diversification of farm products and the greater income being received by the farmer entirely aside from government subsidy are part of the foundation that is being laid for greater growth in the South where inviting opportunity is presented.

In this story will be found the thrill created by accomplishment, especially when one considers the record made in a year of depression immediately preceded by other years of sub-normal times.

The progress of the South is unique in that it has, in the main, made steady progress throughout these years.

The foreword in the Blue Book of Southern Progress contains the following: "Opportunities in this territory for development, based upon raw materials which are in abundance, are claiming the attention of producers in other parts of the country as never before. As the facts about the South's wealth of resources become more generally known, the extent of the opportunity that exists here for successful, profitable production will make an increasing appeal to capitalists and industrialists of less favored areas."

Southern banking during 1937 showed an increase in growth on a percentage basis double that of the country as a whole.

Foreign trade through Southern ports has increased consistently during the past five years. Last year the total commerce passing in and out through Southern ports reached a dollar value of \$1,475,624,582, an increase over the preceding year of 29 per cent. Exports through Southern ports, totalling \$1,061,000,000, represent approximately 30 per cent of the total exports of the United States.

In 1936 contracts were placed for industrial plants costing more than \$322,000,000. While this declined to \$223,000,000 for the same class of work in 1937, the percentage of industrial and engineering projects amounted to 36 per cent of the total contracts placed. In general building of apartments, hotels, banks and offices, etc., 1937 gained over 1936 nearly 50 per cent.

It is not generally known that 87 per cent of the cotton used in all American mills is consumed in the South by textile establishments. The South has more than 70 per cent of the rayon manufacturing capacity of the country.

Cash farm income increased over \$300,000,000 for the South last year, while for the United States as a

whole the cash farm income declined nearly \$800,000,000.

While cotton is the leading crop, the cash farm income last year from 17,709,000 bales, or \$645,325,000, is only 25 per cent of the total cash farm income, which amounted to \$2,851,000,000. Three-fourths of the income the South derives from its agriculture comes from products other than cotton.

Regarded as an agricultural area, the value of the South's manufactured products is $2\frac{1}{2}$ times that of its agricultural products. In manufacturing, the value of output in the South last year reached the enormous total of approximately \$10,500,000,000, which is nearly \$2,000,000,000 more, or almost 25 per cent, ahead of the figure of 1935, which is the latest year for which comparable figures are available.

These are only a few of the facts contained in this latest edition of the Blue Book of Southern Progress, which has been an annual production of this office for many years past.

The South's soil, its climate and its sunshine make for ideal living. The high percentage of its native-born American labor, which is more than 99 per cent in some states (the highest percentage of foreign born stock in any Southern state does not exceed 7 per cent) in contrast with 60 to 65 per cent of foreign stock in some of the highly industrialized centers of the North and East, supplies the reason for the comparative freedom from labor troubles found in the South.

T.V.A. Investigation

The T. V. A. investigation committee expects to include in its inquiry other things besides the charges made by Dr. Arthur E. Morgan. Investors in private utilities, whose securities have been adversely affected by T. V. A. competition, will welcome definite knowledge of how this government enterprise has been conducted and whether it has hewed to the line of objectives originally planned. The taxpayers of the country who have been putting up hundreds of millions of dollars for Senator Wagner's dream also have a vital stake in the matter.

The yardstick which would measure the utility rates for the country has not been found. In fact, the idea seems to have been in the discard for quite a while, which is not surprising in the light of the facts produced by experts, which showed that owing to varying costs in different parts of the country it was impossible to establish a rate for one section that would apply with fairness to all sections. This was true even if taxes were paid by the T. V. A. as private enterprise pays them, which is not the case, and if the capital provided by government had been set up as a debt and the accompanying carrying charges as an expense as private enterprise must do. After five years an acceptable statement of costs is lacking.

How closely the original purposes of the T. V. A. have

As we see it—

(Continued)

been followed, and what new objectives have been pursued, are matters on which the public should be enlightened. How far has diversion been extended to establish competition with private enterprise? With hundreds of millions at stake, and proposals (temporarily held in abeyance) to create seven more T. V. A's., it is well to know.

Objection to W.P.A. Methods

The Alabama Road Builders' Association objects to some of the methods of the W.P.A., particularly to those which have to do with Federal financed day labor employed on public construction work. In a statement issued recently, the Association says:

"We object to a Federal financed day labor construction program because the excessive costs of this kind of work are concealed from the local taxpayer. Normally, local construction work can only be paid for by the taxes on real estate properties for which a tax bill is annually submitted to the local voter. * * * There is naturally every effort on the part of local officials to raise the amount of local employment regardless of cost to the Federal government. When the government pays 80 per cent of the cost on local construction projects, as under W.P.A., there is not and never can be any interest on the part of local officials as to what the cost may amount to."

In view of competition which the government offers in the construction industry to private employers, the Association makes the point that "general recovery cannot occur until the capital goods industries be placed on a production basis, and since the construction industry is the largest single unit of the so-called capital goods industries, and since the W.P.A. overwhelmingly concentrates its efforts on construction projects, it is utterly impossible to absorb Federal relief workers into private employment."

Cost of Government

The National Industrial Conference Board presents in a comprehensive report, "Cost of Government in the United States, 1935-37," interesting figures as to the rising cost of government and the extent of the tax load that corporations have had to bear.

In 1937 corporations paid \$1,057 million in federal income taxes, which was an increase of 168 per cent as compared with 1933. Incidentally, this increase in taxes, which accompanies an increase in total governmental expenditures, has greatly exceeded the rise in population "with the result that on a per capita basis there has been an increase in expenditure by government from \$79.96 per capita in 1923 to \$132.73 in 1936."

Rail Officers Predict Better Business

Leading railroad executives, meeting at Washington in the latter part of June, expressed themselves as being more optimistic about the outlook for fall business than they have been recently. Basing their opinions on the upward trend in carloadings, which on some roads have made the best showing in June they have made for more than six months; also the fact that their cash position has been improved, with gross revenues in some instances running 15 per cent above June a year ago, the general view, conservatively expressed, was that business would be better before it was worse.

The falling off in general business came at a bad time for the carriers of the country, and coupled with high wages and high taxes reduced a buying power very necessary to the producers of durable goods. Probably no single factor can contribute more to the return of prosperity than the return of railroad buying to the market as in normal times. We have been publishing for several months past, in conjunction with state maps showing the South's resources, the extent of the purchases made by the carriers in various states. It is an illuminating disclosure of the volume and variety of railroad purchase orders even in remote districts.

Resource Maps

The MANUFACTURERS RECORD continues in this issue its publication of resource maps of the Southern states. These are being printed in alphabetical order and the detailed description and map of Florida's resources appear on another page as a special supplement. This is the third of the series—Alabama and Arkansas having preceded it.

We expect to tell in a similar descriptive way, in the August number of the MANUFACTURERS RECORD, of Georgia's resources which form the basis of its invitation to industry.

No feature of the work of the MANUFACTURERS RECORD recently has attracted more attention than these detailed studies of Southern resources. They give the reason in graphic form for the marked advance the South has made in a period of depression. They serve the added purpose of acquainting the people of each state with resources of which too many are not fully informed.

The work of the MANUFACTURERS RECORD for 56 years has been devoted to the upbuilding of the South and it is gratifying to receive letters of commendation from all quarters on this new undertaking, pointing out the practical benefit that will ensue by showing the true basis for the development taking place, as well as the opportunities for greater growth.

Soil, climate, wealth of forest and mine, and native American population of the South are claiming increasing attention on the part of capital and industry.

Our Ample Petroleum Resources

AMONG prime materials essential to the machine-age civilization petroleum* is outstanding, if only because of the variety of ways in which this commodity enters the daily life of the average American family. It is estimated that 36 barrels of oil per year are consumed by the American family. This is far more than is required by the average family of any other nation. It is indicative of the petroleum industry's part in maintaining America's higher standards of living.

With petroleum and its products ranking so closely to food, clothing, and shelter in the list of traditional economic wants, there is small wonder that there should be wide-spread and continuing interest in the adequacy of supply. This interest has existed for years. At times it has taken the form of alarm. "Scares of scarcity" recur periodically, and equally often prove unfounded.

Colonel Drake's persistence in drilling this country's first commercially-productive oil well was viewed by the economic sooth-sayers of that early day as proof of his folly. There was no evidence, they said, that an adequate supply of oil would be available, even if some could be produced. Within 10 years after the Drake well came in, rumors were circulated that the oil fields were approaching exhaustion. Identical rumors have attended the development of every new oil-producing area.

Natural phenomena attending the production, and even the existence, of oil are made to order for those who take their prognostications nonchalantly. A host of unknowns, unmeasurables, and variables are available. These, the skillful and inspired prognosticator, can—and often does — adapt, adopt, and rearrange to suit his immediate purposes.

Oil is a liquid and migratory mineral. Its presence is not always apparent on the surface. Even when an oil pool definitely is located, measurement of its potential productiveness is difficult.

Man's knowledge of the characteristics and properties of petroleum comparatively is new. The American petroleum industry has developed within less than a century. Scientists are making progress in studies and research, but the time has not yet arrived when any man can speak definitely, and find his fellows in

*The terms "petroleum" and "oil" are used interchangeably throughout the article.

BY

W. R. Boyd, Jr.

Exec. Vice Pres., American Petroleum Institute

definite agreement with him, concerning the creation or the existence of oil.

Because of these circumstances, it still is possible, for political or other advantage, to sound the alarm of impending shortage. And so many alarms of shortage sometimes are sounded, some of them in all sincerity and honesty, that the average citizen is likely to find himself in a quandary as to whom and what to believe. The practical mind, however, will be inclined to recall that this country never has experienced an oil shortage to the extent of general inconvenience. Current indications are that any such eventuality is unlikely to develop, certainly within generations possibly within centuries.

The first estimate of the nation's oil supply, which at least had the aura of officiality, was made by Dr. David T. White, then head of the United States Geological Survey, for 1891. His report stated that certain regions of Pennsylvania, New York, West Virginia, Ohio, Colorado, and California—all producing oil at the time—would remain the nation's outstanding oil-producing areas. Warning was sounded that depletion of these fields was fairly imminent.

Up to and including 1891, some 504,932,000 barrels of crude oil had been produced in this country. Since 1891 the number of oil-producing states has increased to 23. In many, the available supply of crude vastly has exceeded that reported to be available in the first oil states. The shortage believed to be fairly imminent in 1891 largely has been submerged in the fact that since 1891 an estimated total of 19,500,000,000 barrels of oil have been produced in the United States.

Since 1891 also the petroleum industry has developed from a one-product undertaking into a service satisfying hundreds of human needs. The motor vehicle and the mechanization of all industry have increased the demand for various petroleum products to unprecedented figures. In 1936 the per capita consumption of petroleum products in this country amounted nearly to 380 gallons, or about nine barrels, as compared with consumption of 30 gallons, or only about three-

quarters of a barrel, in 1891.

Twice as much oil now is being produced in one year as was produced throughout the first 32 years of the petroleum industry in the United States. Some of the states which did not even figure in the 1891 estimate, subsequently have produced more oil than the states which were mentioned; more oil than has been produced by all the other oil-producing countries of the world combined.

The first modern estimate of petroleum reserves, published in 1914, placed the total at 6,000,000,000 barrels. Subsequent production exceeded 17,500,000,000 barrels. In 1915 the reserves were estimated at 7,500,000,000 barrels. Subsequent production exceeded 16,000,000,000 barrels. In 1921 reserves were reported as 9,000,000,000 barrels. Subsequent production exceeded 14,000,000,000 barrels. In 1934 the estimate of reserves was increased to 13,250,000,000 barrels. About 4,000,000,000 barrels subsequently have been produced.

The petroleum industry, through the American Petroleum Institute, sought to estimate reserves as accurately as humanly possible in 1935. After prolonged study, the Institute's Committee on Petroleum Reserves reported the total of proven reserves as of January 1, 1935 as 12,177,000,000 barrels. In 1936 the Institute's committee made a new survey, reporting proven reserves as of January 1, 1937 totaling 13,063,000,000 barrels.

The most recent survey was made by the Institute committee in 1937. Several months were spent upon the project. The best engineering minds of the industry were focused upon the task of estimating reserves with the greatest possible accuracy on the basis of the most reliable data available. This committee reported that, as of January 1, 1938, the proven oil reserves of the United States totaled 15,507,268,000 barrels.

It will be noticed that, through the years, estimates of reserves have increased rather than diminished, and this despite enormous production. The latest estimate reflects belief in the existence of the largest petroleum reserves in history. The Institute committee explained that its calculations made no allowance for any additions to reserves from new discoveries. The estimate gave no consideration to oil that might be produced from roundly a billion acres of undeveloped geological formation favorable

to the accumulation of oil. The committee said it had been forced to revise its 1936 estimate both because of new discoveries and of the development of new data revealing even greater oil possibilities in new producing area than previously had been expected.

The petroleum industry, which itself is directly concerned with the availability of supply and the extent of reserves, regards such estimates as indicating "oil in sight." That is to say, oil recoverable by currently known and used methods of drilling, development, and production. Thus, while proven reserves may be measured at 15,507,268,000 barrels, the largest in history, even that vast store of oil constitutes only a portion of total and eventually available supply.

Petroleum reserves are considered "working stocks," or underground storage which supplements oil in production and stored on the surface. The industry is inclined to believe that the extent of proven reserves need not be excessive, especially since natural underground storage is superior to any man has devised.

Still, the upward trend in estimates of reserves should convince the apprehensive that there is little or no logical reason currently to fear a scare of scarcity. Further conviction may be found in the progress made by the industry itself along several well-defined lines. Any and all of these have the effect of expanding the nation's petroleum supply, whatever actually it may be. This, in itself, is an interesting situation, and indicative of the importance of such intangible factors as technological progress.

Science largely has replaced superstition in the search for oil. Where once the lonely prospector sought surface indications, or drilled where he guessed prospects were favorable, today the sciences of geology, geophysics, and paleontology are combined to solve the problem. The early "wildcatter" played his hunches, carefully avoiding swamps and sawmills, drilling near cemeteries and schools. The modern prospector depends upon precision instruments, aerial surveys, study of geological formations, and natural phenomena. Frequently he finds oil where others have said it could not possibly be!

It still is true that only the drill can prove the presence of oil, yet the diminishing proportion of "dry holes," or non-productive wells, to total wells drilled, may be accepted as criterion that in the search for oil geology is more efficacious than guesswork. This is a logical and natural development. Drilling for oil has become an expensive undertaking; too expensive, in fact, to warrant risking so heavy an investment upon a hunch; so expensive, indeed, as to require consideration of every scientific fact and factor before work is begun.

The first American oil well was drilled

to a depth of less than 70 feet, with a pitifully crude rig. Today the production of oil from horizons 5,000 to 10,000 feet below the surface is not unusual. Some wells already exceed two miles in depth. Drilling to three miles is viewed as possible with currently available power and equipment.

It is scarcely 15 years since the world's deepest well was bottomed at less than 7,500 feet. It is only about 10 years since the 10,000-foot level was reached. Yet modern "deep holes" are tapping oil sands at horizons once unknown. They lift oil from sands underlying those shallower strata which may have been exhausted. They tap new producing possibilities even beneath oil fields which have been abandoned. Engineers say the day is not far distant when it will be possible to produce oil from depths as great as 15 miles, perhaps deeper.

Today more is known about the function of natural gas and of hydrostatic pressure in producing oil. It is possible to evaluate these pressures, and so to drill and to operate both wells and fields that these natural forces are preserved, assuring recovery of the maximum amount of oil.

More efficient as a conservation measure than all the laws which have been written upon the statute books is the ability of the modern petroleum engineer so to develop and to operate a field that its producing life is prolonged and the proportion of available oil actually recovered greatly is increased. Many an oil field which was exhausted within a short period still would be producing today had modern technique been employed.

As a matter of fact, old and supposedly exhausted oil fields actually are being restored to production. Introduction into the oil sands of natural gas or water creates pressure sufficient to strip the subterranean strata of additional oil. There are indications that the old Bradford Field of Pennsylvania now is capable, by judicious use of a repressuring method known as the "water drive," of producing as much oil as it did in its peak year, 1881!

Another great change has come about. Competitive drilling and development of new oil fields, with their "oil booms" and "boom towns," their haste, waste, and expense, are going out of style. They were brought about through operation of the "rule of capture," established by the courts in the day when it was believed that petroleum ran in underground streams. The courts held that he who first reduced oil to possession established ownership. The necessity for drilling in self-defense, lest this fugacious mineral which heeds no surface rights and respects no boundaries be lost through production in a neighboring well, resulted in costly drilling races.

Planned development is less picturesque, but more profitable. More profitable not only for the oil man, but for the average citizen. Petroleum engineers definitely have established that it is more economical to avoid perforating a new oil field with numerous and unnecessary holes. The trend of thought, and to a degree the trend of action also, is toward controlled and cooperative drilling, development, and operation of oil pools. Here effort is being made to take best advantage of natural conditions, to reduce the ultimate cost of production, and to increase the maximum volume of oil recovered. There is obvious saving both to producer and to consumer in the elimination of expense, and substantial savings in oil and natural gas which otherwise might be lost. The results are lower prices for consumers, further expansion of reserves.

Supplementing the efforts of the engineers are certain federal and state laws, which have the effect of enabling acts. State commissions, operating proration laws, enacted in oil-producing states signatory to an Interstate Oil Compact, frequently have served conservation by adjusting to market demand, as estimated monthly by the U. S. Bureau of Mines, the amount of oil to be produced by any well and by any field. A federal law, known as the Connally "Hot Oil" Act, has discouraged the production of oil in excess of allowable by prohibiting its movement in interstate traffic.

Attention is being paid both by the industry and by the states to the development of oil fields on the unit plan. Interests in a field are encouraged to pool their holdings, organize an operating committee, and share proportionately in oil produced or in the proceeds from its sale. The saving both in overhead and development costs, is both large and obvious.

Conservation of the nation's oil supply is not, however, a matter which must depend solely upon efficiencies in production. Refining technologists have contributed as much as have the field men. In the industry's research laboratories there have been developed ways and means, first, of obtaining proportionately greater quantities of refined products from a given volume of crude oil, and, second, of producing useful products capable of performing a greater amount of useful work.

Investment of upwards of \$12,000,000 a year for research has made petroleum refineries huge, scientifically-controlled plants which operate continuously. Daily they convert as much as 150,000 barrels of crude oil into hundreds of useful products. Continuous operation, plus the factor of flexibility, work both for continuity of supply and economy of production.

Petroleum refineries utilize many different methods of processing.

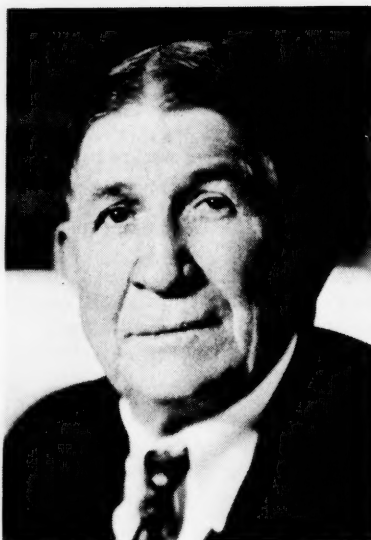
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Series of Maps and Articles Relating to Southern States is Invaluable to Industry

ALTHOUGH one of the first portions of what is now the United States to be trod by the white man, Florida today is America's "Last Frontier." Neglected as the Tide of Empire moved westward, yet Florida has remaining vast lands, forests, mines and natural resources that await the hand of far-sighted pioneers and developers.

While this is particularly true of Florida, it is also generally true of the South as a whole. For this reason I am glad to commend the MANUFACTURERS RECORD upon its series of maps and articles relating to the industrial opportunities of the Southern states. No doubt this series will interest many in the possibilities of my State of Florida and our Southern states.

In formation such as this about the Southern states is invaluable to industrialists already located in the South as well as those progressive industrialists



Governor Fred P. Cone

considering Southern and Florida plant locations. Long may the RECORD keep up this fine work!

The South is at last coming into its own and this will bring double benefits to Florida. For, in addition to the industrial growth our State will obtain along with other portions of the South, we will also enjoy additional benefits from increased Southern import and export trade through Florida ports.

Florida as well as the South's future is assured because of our strategic position. We are in the direct line of trade between North, Central and South America, and near world trade lanes through the Panama Canal.

Thus facing the future with faith in our State and our South, we of Florida look forward to doing our bit in the advancement of the South and our great United States.

FRED P. CONE,
Governor of Florida

FLORIDA WELCOMES VISITORS BY THE MILLIONS

It produces: Crops grown in all the Southern states, Hawaii, Japan, Southern China, the Philippines, India, Arabia, Egypt, the Holy Land, North Africa and many Isles of the seas.

It has: Minerals, Naval Stores, Lumber, Fisheries, Factories, Splendid Ports, Fine Roads, and Airports galore.

It is: The way station between North and South America.

For Further Particulars Write to the

STATE DEPARTMENT OF AGRICULTURE, TALLAHASSEE, FLA.

Florida and Its Opportunities for Industry

FLORIDA, the "Land of Flowers," first discovered in 1513 by Juan Ponce de Leon, is unique among the states of the Union in a number of respects. With St. Augustine the oldest city of European origin in the United States, Florida has changed ownership no less than 13 times and its people have lived under the sovereignty of five different flags: Spanish, French, British, Confederate and United States. It was ceded to the United States in 1819.

Admitted to the Union as the 27th state in 1845, Florida, with a land area of 58,666 square miles, ranks 21st in size and 31st in population, the latter in 1937 being 1,657,000 or more than three times the population in 1900.

Transportation

ADEQUATE transportation facilities are among the principal requirements of industry. In this respect Florida leaves little to be desired. Of the 67 counties in the state, all but one are served by the railroads which have in the state a total mileage exceeding 5,000 miles. Passenger service between Florida and the metropolitan centers of the country with fast de luxe trains, are the boast of the railroads operating in the state. Similarly, the quantity and variety of agricultural and fish products demand the latest type of freight transport.

The highways of the state total approximately 30,965 miles of which 7,410 are state maintained and 6,521 are hard surfaced and others are under construction, the mileage of improved roads lengthening constantly as drainage of land proceeds and farms lands are extended.

With a general coast line of 1,197 miles, Florida far outranks any other state. At convenient distances throughout the length of this coast line are seaports with adequate shipping facilities for coastwise and foreign trade, while many ships make these ports their regular port of call. The total value of merchandise passing through the several customs ports in 1937 was \$44,020,903, and \$22,050,702 respectively for exports and imports. In addition there are numerous navigable waterways throughout the state while the Florida Ship Canal connecting the Atlantic with the Gulf of Mexico via the St. John's river, is under construction.

Commercial airlines provide constant passenger and freight service not only to all parts of the United States but to several foreign countries, including most of South America.

Climate

FLORIDA from a climatic standpoint is sufficiently well known to require but little detail. However, though situated close

to tropical latitudes, the climate is decidedly equable due to the proximity of the Atlantic Ocean and the Gulf of Mexico. The average annual temperature of 70.8° Fah., ranges from an average for January of 59° to a comparable average of 81.3° in July and there are seldom less than about 250 days entirely free from frost while killing frosts in the southern part are extremely rare. The average annual precipitation of 52.78 inches ranges from an average of 7.22 inches in July to 2.81 inches as the average for January.

Manufactures and Banking

IN 1936, the latest year for which such statistics are available, Florida had 53,412 wage earners employed in manufacturing and the aggregate value of products was \$162,677,000, a gain of \$46,397,000 or almost 40 per cent over the value for 1933. The principal manufacture is that of cigars with a value of nearly \$20,000,000 giving employment to over 9,000 people. Lumber and timber, exclusive of finished products, come a close second with production value totaling almost \$19,000,000 and employing more than 11,000 individuals. The value of canned and processed fruits, vegetables, fish, etc., was about \$12,000,000 and since 1935 a number of additional plants have been erected. The cost of materials, containers, fuel and purchased power for all manufactures in the state amounted to \$76,631,000.

There were 162 banks in the state in 1937 with aggregate resources of \$382,224,000 and individual deposits of \$343,396,000. Capital stock of these banks including capital notes and debentures is reported as \$22,667,000 while savings deposits totaled \$64,622,000.

Agriculture

WITH 6,048,000 acres in farm land representing only 17.2 per cent of the state's total land area, the aggregate crop acreage is 1,540,000 acres. The yield from this however produced a cash farm income of almost \$135,000,000 in 1937 or an average of approximately \$88.00 per acre compared with the national average of \$25 per acre.

Although Florida because of its climate and soils is capable of and does grow virtually every farm crop including those of tropical origin, by far the majority of the cash income is derived from citrus fruits and truck produce. Production of the former is constantly increasing as evidenced by the gain of over 8,000,000 boxes or 20 per cent in oranges and grapefruits from the average of 1928-32 to 1937 where the total reached 35,000,000 boxes. Limes increased similarly from the negligible average quantity of 8,000 boxes in 1928-32 to over 110,000 boxes in 1937.

Great as Florida's citrus industry is, it is probable that truck crops will maintain an important position in view of the fact that three and four crops per year are not unusual. The value of truck produce in 1937 exceeded \$25,000,000 and the acreage

devoted thereto increased nearly 20 per cent from the 1928-32 average.

In addition to the foregoing agricultural products the state grows a considerable quantity of other crops all of which offer numerous possibilities for industrial development. Outstanding among these are cotton, tobacco, corn, sugar cane and peanuts.

With continuance of the land drainage program and development of the state's innumerable waterways it is reasonable to assume that Florida's expansion of agricultural industry is only at the threshold.

Forest Products

THE forest area of Florida estimated at 23,600,000 acres is the largest of all the Southern states and has a timber stand of 23,422,000,000 board feet comprised of 13,986,500,000 board feet of pines, 3,873,300,000 board feet of cypress and 5,562,200,000 board feet of hardwoods. The total lumber sawed in 1936 was 816,224,000 board feet of which 744,277,000 was softwood and nearly 20 per cent was used for veneer. Consumption amounted to 1,205,100,000 board feet. Of the 8,262,200 man-days of employment in the forest industries, 5,851,400 were used in the forest. There are 529 sawmills in the state—486 pine, 22 cypress and 21 hardwood. A considerable area of the central and south central counties are well suited to the production of timber for use as pulpwood.

At the present time there are four pulp and paper mills in the state, two in each of the U. S. Southern Forest Surveys northern survey units. In these two areas embracing 36 counties there is over 2,500,000 acres of uncut or partly cut old growth, about 8,000,000 acres of second growth and nearly 35,000,000 cords of timber in pulpwood specie.

Naval stores form one of the largest industries in Florida, the state's product being in excess of 26 per cent of the entire country's output. Since approximately 60 per cent of the world's naval stores originate in the United States, the value of Florida's contribution is large. During the crop year April 1, 1937 to March 1938, there were 136,836 fifty-gallon barrels of turpentine produced and 436,366 five hundred pound barrels of rosin.

Mining and Minerals

THOUGH limited in the variety produced, Florida is an important non-metallic mineral state, the value of products having nearly quadrupled since 1900.

On the accompanying map are indicated those minerals which are commercially available and produced in substantial quantities at the present time. Among these, phosphate is the most important and comprises about 80 per cent of all phosphate produced in this country while the production of fuller's earth is the second largest.

In addition to the minerals shown, several others are produced on a smaller scale while still more are known to exist and it remains for exploration to determine the size and quality of their respective deposits. The following are minerals which it is anticipated will warrant attention for steady commercial production.

Chert	Marl
Coquina	Ochers
Dolomitic Limestone	Peat
Gypsum	Rutile
Ilmenite	Travertine
Zircon	

JULY NINETEEN THIRTY-EIGHT

Taxation

SEVERAL years ago, Florida passed an amendment to the state constitution providing that "all industrial plants which shall be established in this state on or after July 1, 1929, engaged primarily during said period in the manufacture of steel vessels, automobile tires, fabrics and textiles, wood pulp, paper, paper bags, fiber boards, automobiles, automobile parts, aircraft parts, glass and crockery manufactures and the refining of sugar and oils, and including by-products, shall be exempt from all taxation, except that no exemption which shall become effective by virtue of this amendment shall extend beyond the year 1948. The exemption herein authorized shall not apply to real estate owned and used by such industrial plants except the real estate occupied as the location required to house such industrial plants and the buildings and property situated thereon, together with such lands as may be required to warehouse, storage, trackage and shipping facilities and being used for such purpose."

Real estate taxes are based on millages levied by the state, not to exceed five mills with limitations for certain operating expenses. A constitutional amendment exempts homesteads, up to a valuation of \$5,000, from all taxation other than special assessments for benefits. According to unofficial estimates the assessed valuations upon which the millages are levied varies from about 50 per cent down, some counties running as low as 10 per cent.

The assessed value of taxable property in the state is \$515,986,000.

Labor and Wages

LIKE the other Southern states, the population of Florida is predominantly American born, the foreign born whites comprising only 5.7 per cent and those of foreign parentage are likewise small—5.3 per cent. The negro population is approximately 30 per cent of the whole.

Both skilled and unskilled labor is plentiful throughout the state and rates of pay are comparable with those prevailing throughout the South. Colored labor ranges from 10 per cent to 20 per cent lower than that for white labor while all rates vary to a certain extent from place to place particularly in the metropolitan areas as compared to the rural sections.

In the building industry skilled labor averages 85 cents per hour and unskilled labor from 35 cents to 40 cents hourly. In the pulp and paper industry, white skilled labor averages 60 cents per hour and unskilled labor is approximately half that amount.

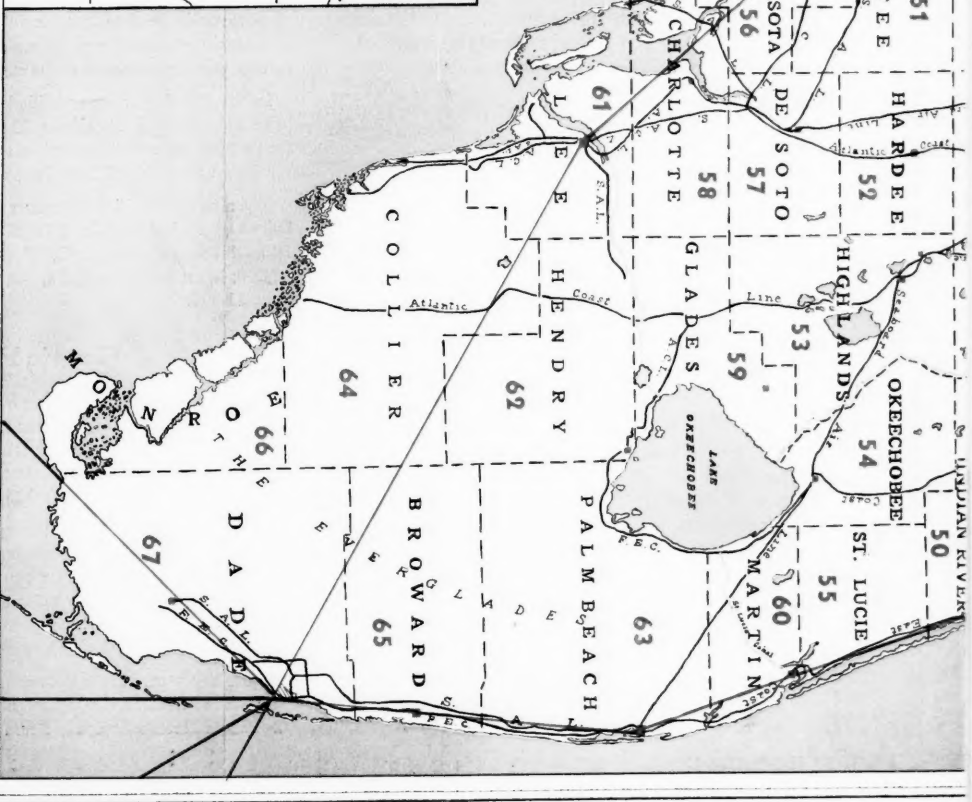
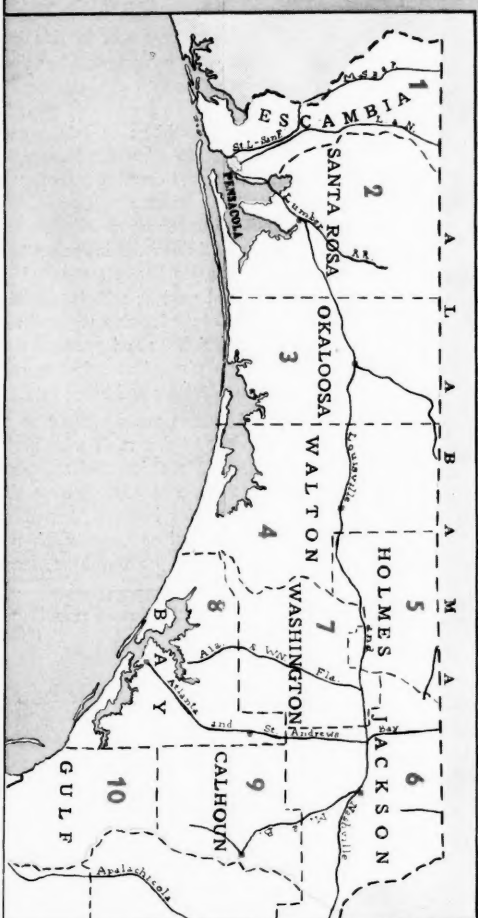
The nine largest cities in the state with their approximate populations are: Jacksonville, 135,000; Miami, 120,000; Tampa, 100,000; St. Petersburg, 42,000; Pensacola, 32,000; Orlando, 31,000; West Palm Beach, 28,000; Lakeland, 22,000; and Daytona, 21,000.

Electric Power

THE electric power generating facilities of Florida which now have an installed capacity amounting to 377,266 kilowatts, increased 322 per cent between the years 1925 and 1929 and are at present adequate for all immediate demands. Steam power comprises the major part with 325,282 kilowatts.

During 1937, 925,951,000 kilowatt hours were produced compared with 814,420,000 kilowatt hours in 1936. Of this amount 877,338,000 kilowatt hours were produced by plants operated by fuels. Altogether, there are 87 plants in the state operated by 33 companies. The principal plants with their generating capacity are:

15 Florida Power & Light Co. steam plants	126,690 kilowatts
4 Florida Public Service Co. steam plants	28,850 "
2 Tampa Electric Company steam plants	35,000 "



FLORIDA

Its principal materials and transportation facilities offering opportunities for industry, with additional facts on the reverse side pertaining to industry and its growth within the state.

Minerals

Counties in which material is commercially produced

- Clay—1, 18, 28
- Diatomite—1
- Fuller's earth—1, 35
- Kaolin—33, 35
- Limestone—6, 34, 35, 46, 47
- Phosphate rock—38, 46, 47, 51
- Sand and gravel—11, 41, 46, 47, 53, 67
- Timber
- Longleaf—slush—1 to 9, 11, 12, 14-16, 22, 24, 25, 28, 30 to 35, 37 to 47, 53

Longleaf—slush—cypress—2, 4, 8, 10, 13, 15 to 21, 26 to 37, 39 to 51, 57-59

Naval stores—1 to 18, 20 to 26, 28, 33, 34, 36-38, 40, 42, 43, 45 to 48, 50, 51, 53, 62

Fisheries—1 to 1, 8, 10, 18, 19, 21, 22, 29, 30, 37, 39, 44, 45, 50, 51, 54, 55, 58 to 67

Slush—cypress—53 to 56, 58 to 65, 67

Aggricultural products

Truck crops & fruits—1, 6, 8, 10, 14, 16, 20, 25, 27-29, 31-33, 35,

Loblolly—hardwoods—7, 11 to 14, 22, 32, 35

Citrus fruits—2, 6, 8, 23, 32, 33, 35, 37 to 47, 49 to 53, 55 to 61, 65, 67

Cotton—1 to 7, 9 to 16, 24, 25, 32

Mixed bottomland hardwoods—5, 13, 18, 20, 35

Sugar cane—1 to 6, 8, 11 to 14, 16, 20 to 27, 29, 30, 33, 36 to 41, 53, 54, 59 to 63

Truck crops & fruits—1, 6, 8, 10, 14, 16, 20, 25, 27-29, 31-33, 35,

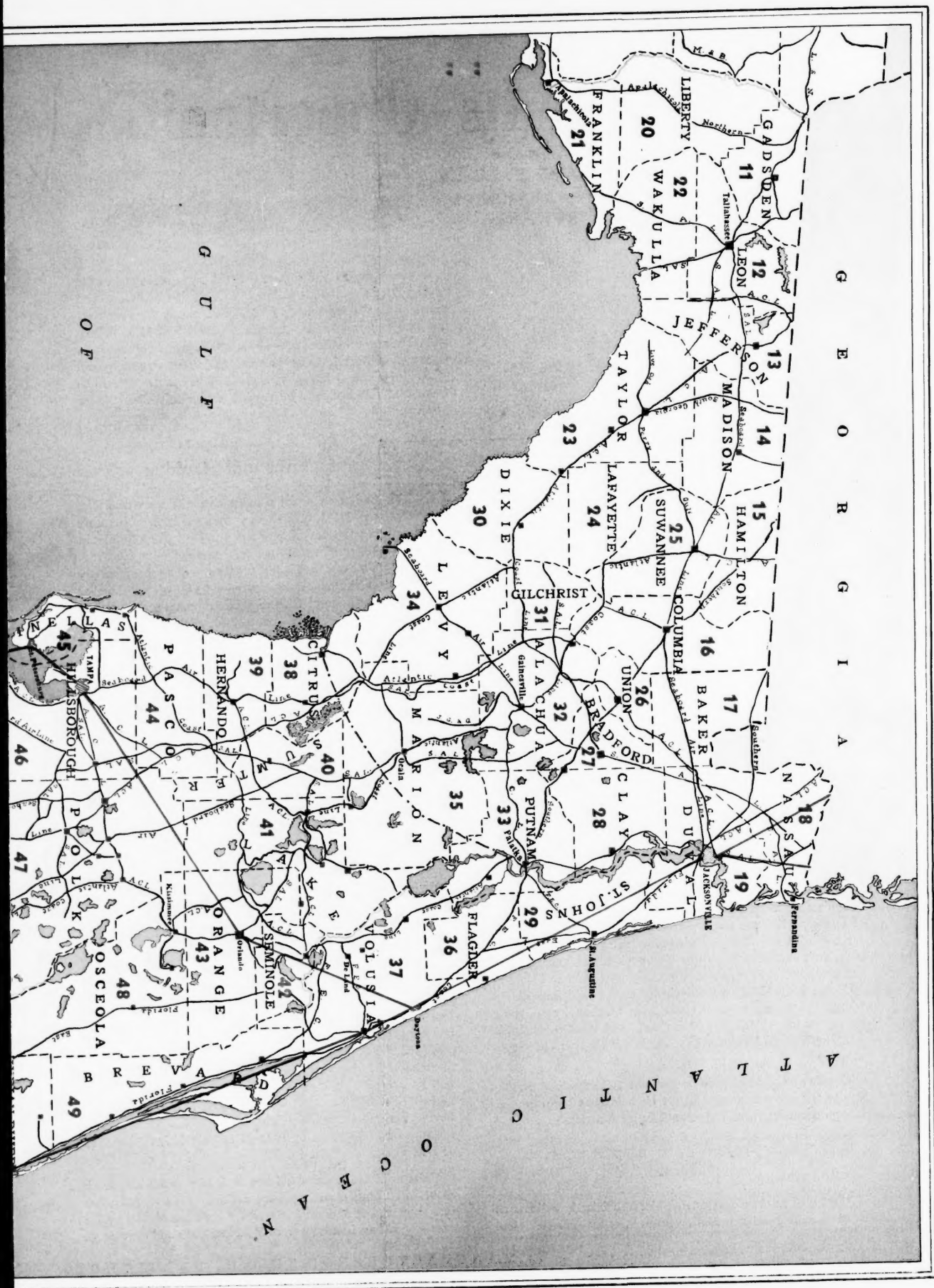
Cypress—hardwoods—6, 10, 20, 21, 23, 30, 34, 38 to 41, 51, 64

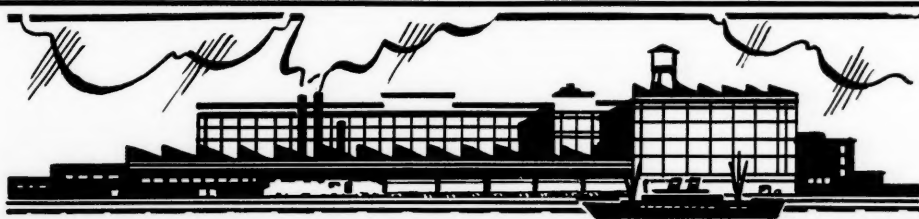
Truck crops & fruits—1, 6, 8, 10, 14, 16, 20, 25, 27-29, 31-33, 35,

Airports—also at principal cities printed in red

- Railroads
- Navigable rivers
- Proposed route of Florida Ship Canal
- Airlines

Airports—also at principal cities printed in red





TO AID AND PROTECT INDUSTRIAL DEVELOPMENT IN THE SOUTHEAST



Sound optimism

THE Southeast has neither the time nor inclination to talk 'poor-mouth.' Its people have a natural optimism that overcomes obstacles. Either by cause or effect, business is relatively much better in this rapidly growing section. Goods made with the many important advantages of a *Southeastern Location* find ready acceptance in the Nation's markets.

Moderate climatic conditions alone provide a tremendous inducement to Indus-

try seeking lower production cost. All other production factors are assets—not liabilities. An industrial expansion of tremendous scope is now under way in the Southeast — an expansion which gains in momentum as Industry studies the advantages of a *Southeastern location*.

The people of the Southeast have a deep and abiding faith in their future. The Southeast is optimistic—and with good cause.



WE, THE GOVERNORS . . .

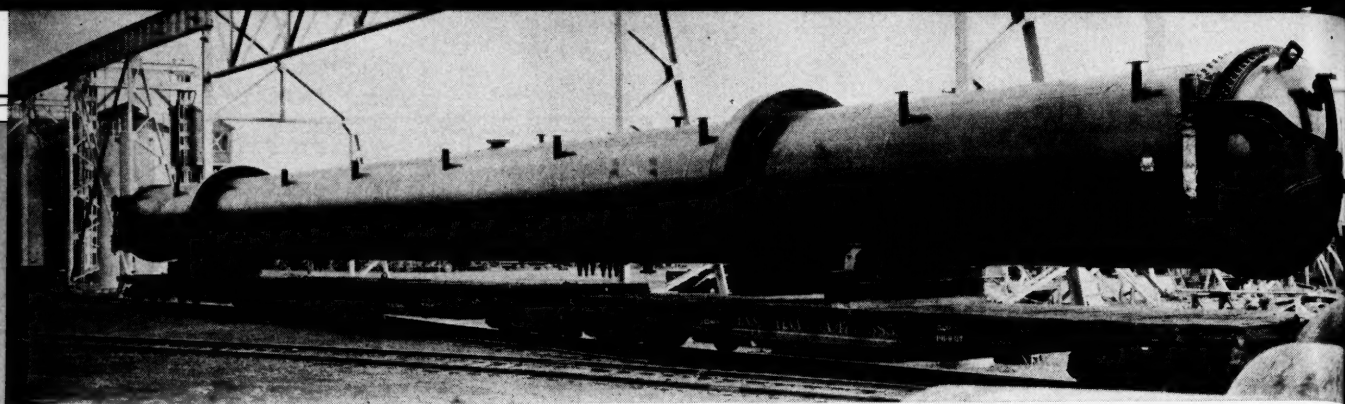
WITH a view to aiding industrial expansion of our section and the stabilization of employment we, the Governors of the Southeastern States, set forth the following objectives: (1) Equitable freight-rates as affect the Southeast (2) Uniform taxation policies (3) Friendly labor attitude between employer and employee (4) Cooperation with Federal Government on

proper major policies affecting industrial development.

It will be our aim by working together on these objectives to maintain conditions favorable to sound industrial development so that the Southeast will reap the full benefits of the ever-increasing trend toward Industrial Decentralization, and gain a proper balance between agriculture and industry.

SOUTHEASTERN GOVERNORS' CONFERENCE

LAWRENCE WOOD ROBERT, JR., Executive Director, Bona Allen Bldg., Atlanta, Ga.



Industrial Machinery Exports Up 15 Percent Over A Year Ago

United States' exports of industrial machinery during May were valued at \$23,544,012, a 15 per cent increase over the May 1937 figure of \$20,550,431, according to the Machinery Division of the U. S. Department of Commerce.

The continued advance in the total trade was due entirely to improved shipments in 3 of the 7 major groups into which industrial machinery has been divided for statistical purposes.

The sharpest gain was recorded in power-driven metal-working equipment, in which the May foreign shipments exceeded those of a year ago by 80 per cent, being valued at \$9,078,953 against \$5,044,632. Increased shipments were made in all types except rolling mill machinery, the major gains including engine lathes, \$710,065 against \$297,634; turret lathes, \$407,699 against \$297,802; other lathes, \$209,121 against \$122,465; vertical boring mills and chucking machines, \$594,354 against \$195,843; knee and column type milling machines, \$802,895 against \$325,522; other milling machines, \$591,101 against \$193,129; drilling machines, \$417,858 against \$219,669; internal grinding machines, \$425,226 against \$168,356; other metal-grinding machines, \$342,771 against \$75,411; sheet and plate metal-working machines, \$694,228 against \$284,933; forging machinery, \$303,114 against \$174,571.

Shipments abroad of other than power-driven metal-working machinery during the month were valued at \$371,695 compared with \$380,582 a year ago.

Valued at \$1,573,948, the exports of power-generating equipment, except electric and automotive, were 40 per cent greater than a year ago when they totaled \$1,119,050, the Division reported. Overseas consignments of Diesel and semi-Diesel engines were valued at \$312,787 against \$178,257, and locomotive parts and accessories advanced to \$383,339 from \$86,934 in May 1937.

Fabricated at Birmingham, Alabama, by the Chicago Bridge and Iron Company for the Republic Creosoting Company of Lima, Ohio, this creosoting cylinder measures 151 feet 6¾ inches long and is 8 feet in diameter. Equipped with two quick opening doors and designed for 200 pounds per square inch working pressure, the cylinder is of welded construction throughout. Transportation, which was effected by rail, involved considerable preparation as the cylinder was the longest single unit ever carried over the Louisville and Nashville rails. Weighing 222,000 pounds and standing nearly 15 feet above the rail after loading, it occupied all available space on the three flat cars which were required

Florida Beach Property For Sale

*Land & Lots
on Anastasia Island
near St. Augustine*

*Town property
at Flagler Beach
Flagler County*

*Investigate the possibilities of Beach
property for development
in Florida*

Model Land Company
Flagler System
St. Augustine, Florida

Georgia's Paper Manufacturing Prospects

BY

J. C. McAuliffe

*Executive Vice-President & Secretary,
Georgia State Chamber of Commerce*

PLANs for the construction of a large newsprint mill in Georgia, which have been under consideration for some while, are expected to materialize shortly when announcement is made of the site selected.

At the present time three locations are being scrutinized with regard to available facilities. In this connection the Georgia State Chamber of Commerce is supplying the necessary details to the interests engaged in the enterprise. Acreage in excess of 100,000 acres of timber land is available in each instance and surveys are in the process of being completed to approximate relative freight rate differentials and gauge the labor situation before definite conclusions are reached.

An important factor entering into the picture is the possibility of subsequently adding a sulphite section to the plant in view of the large quantities of gum, cottonwood and other hardwoods available in the state. Like most of the Southern states in which increment of hardwoods exceeds the drain, Georgia has a plenty of this type of timber and utilization thereof will benefit rather than deplete the existing stand. Throughout almost all the lowland country, there is a source of supply that borders on the line of constancy with a reproduction record of outstanding rapidity. In many parts the trees attain merchantable pulpwood size in ten years and cutting for this purpose will have the desirable effect of thinning the stand for saw timber size trees. The actual increment of hardwoods in Georgia is about 3,000,000 cords compared with a

drain of only half that amount while the total supply is estimated at nearly 80,000,000 cords.

With regard to pine, although Georgia has been supplying this to paper mills in east Tennessee and western North Carolina for approximately fifteen years and, in addition, now supports two large pulp mills of her own, the growth of pine at present exceeds the consumption by a million cords per year. Consequently, with added fire protection, extensive employment of adequate good forest practices and wise reforestation, Georgia's present supply of 125,000,000 cords of pine is capable of supporting this as well as other new pulp and paper mills.

The interest in paper making in Georgia originated with efforts of the Georgia State Chamber of Commerce to secure a plant for the state shortly before the beginning of the World War and the Georgia Press Association named a committee in 1917-18 to promote the proposition and enlist the aid of the Southern Newspaper Publishers Association in the undertaking. Investigators found that the Georgia pine was suitable for manufacturing into a higher priced paper, namely kraft, and in combination with other woods would satisfactorily produce sulphite products. The Gordon paper mill was one of the first of these enterprises, but since that time interest in the work has increased constantly until now two large mills are operating in Georgia, others are in the adjoining states, and prospects for two or three new plants are being seriously considered.

Construction of the projected plant, whether it be at the north Georgia point or at one of the two locations tentatively suggested in south Georgia, is expected to begin shortly after a decision is reached. Meanwhile the cooperation of large landowners has been secured in each instance and the outlook for early



A good stand of second growth pine in Georgia

building activity is brighter than it has been at any time in the past.

The new law passed by the last legislature, creating the State Authority, does not involve the credit of the state, or add any obligations, according to authorities on the question. It was devised for the purpose of establishing the pulp and paper industry on a sound basis and to provide a dependable organization for investors in Georgia to place their funds in this industry with all the possible safeguards that can be secured. The act also specifically encourages conservation and production of timber as a profitable money crop.

Georgia naval stores operators and owners of other large tracts of forest land in the state are giving more consideration to reforestation and care of existing timber stands at this juncture than ever before in the history of the state. Rehabilitation of tens of thousands of acres of worn out lands, especially in middle Georgia, is under way and hundreds of thousands of seedlings already have been planted. In many instances natural reforestation has occurred on lands retired from cotton growing after the boll weevil infestation of 1920-22 and these are now, for the first time, being systematically thinned and otherwise adequately cared for.

Indications are that Georgia not only will witness a pronounced development of the pulp and paper industry in the state within a short time, but the business of growing timber will advance during the ensuing years. In some instances attention is being given to growing high-grade saw timber, but the bulk of the attention now is being directed to pulp wood for the pulp and paper industry.

Railroads Spend Millions in Florida Annually

LOOMING large in Florida's commercial and industrial picture is her five thousand-odd-mile network of railroads, with their vast fleet of locomotives and cars, their many repair plants, stations, storage yards, docks, terminals and other facilities.

These railroads not only provide Florida's 1,600,000 people with efficient pas-

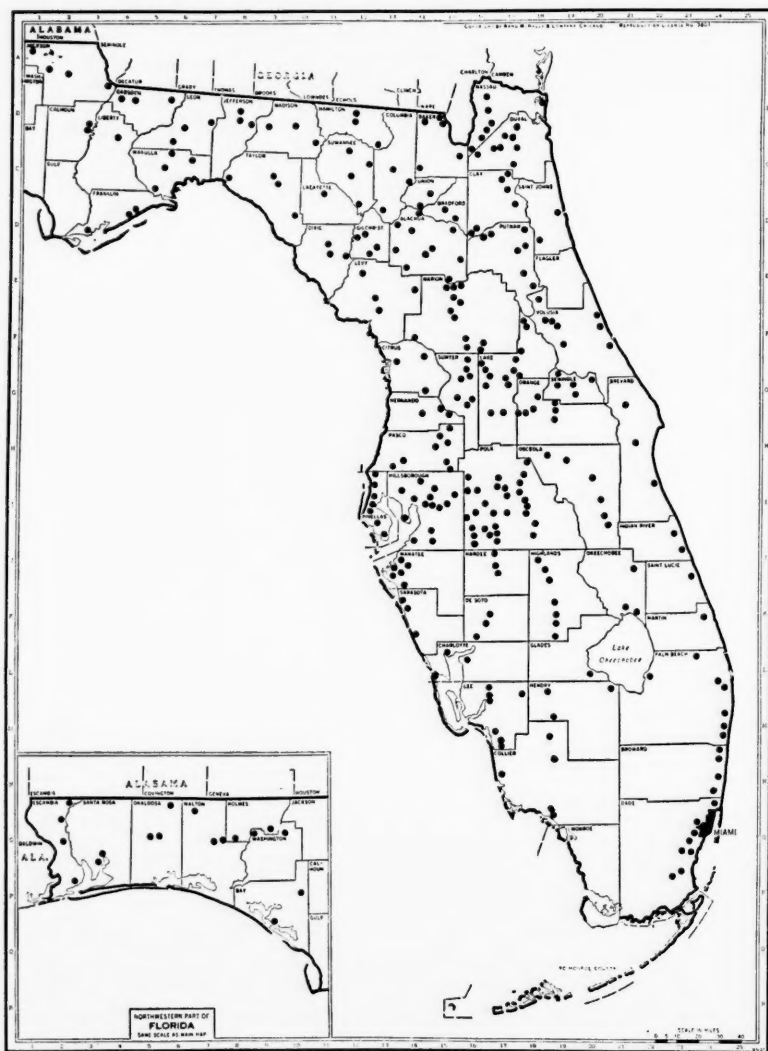
senger, freight, perishable, express and mail transportation, but they also play a major role as purchasers of Florida products, as employers of Florida labor, and as supporters, through taxes, of state, county and local governments. Taken together, they assume gigantic proportions, surpassing in investment, in employment and in payrolls any other industry in the

state. Railroads are not only the "backbone" of Florida's transportation system, but they are some of the ribs and other framework as well as a substantial part of the flesh and blood of the state's economic life.

Florida's important stake in her railroads is evidenced by the fact that in 1937, a year of sub-normal railway activity, expenditures of the principal railroads in the state for labor, materials, supplies and taxes exceeded \$25,000,000. In addition, these railroads spent substantial sums in Florida for such items as water, ice, electricity and advertising. Sizeable expenditures were also made by the Pullman Company, the Railway Express Agency, the Southeastern Express Company, the Jacksonville Terminal Company, the refrigerator car companies and several small railroads operating in the state. It is estimated that the total expenditures for all purposes of all railroads and affiliated companies in Florida last year were in excess of \$30,000,000.

Although Florida's railway development dates back more than a century—to the primitive, mule-powered, wooden-rail line opened from Tallahassee to St. Marks in 1834—it was not until 1879 that the state's railway mileage passed the 500-mile mark. The principal railroads in the state at that time were the line extending westward from Jacksonville through Tallahassee and the line from Fernandina to Cedar Keys. Central and South Florida were virtually without railway transportation.

Florida's period of rapid railway development, as well as her period of greatest agricultural and industrial growth, dates from 1880. In that year, Henry Bradley Plant, president of the Savannah, Florida and Western Railroad, of Georgia, extended the rails of that road to Jacksonville, providing that thriving little city with a direct rail route to the North. In the next few years, while Henry M. Flagler was launching his great enterprise of railway and hotel development on the East Coast, Plant was pushing his rails down the West Coast to Tampa Bay. Under the leadership of Flagler and Plant, Florida entered upon an era of unprecedented growth and expansion. Thousands of miles of railway lines were added to the state's system;



In Florida railroads made purchases in 323 cities located in 64 of the 67 counties in the state

fertile agricultural regions were opened; numerous towns and cities were established; and winter visitors flocked in ever increasing numbers to the numerous resorts reached by these railway lines.

From 530 miles of railroad in 1880, Florida's mileage increased to 2,390 miles in 1890; to 3,272 miles in 1900; to 4,370 miles in 1910; to 5,212 miles in 1920, and to 5,681 miles in 1930. In this fifty-year period, while Florida's railway mileage increased more than ten-fold, the state's population increased five-fold; property values increased twenty-fold; value of farm production increased nineteen-fold; and value of manufactured products increased from 7,650 to 13,000; that of period, the population of Jacksonville increased from 71,560 to 130,000; that of Tampa increased from 700 to 101,000; that of Pensacola increased from 6,800 to 32,000; while Miami, Palm Beach, St. Petersburg, Sanford, Gainesville, Daytona, Orlando, Lakeland and numerous other thriving cities have attained their entire growth in this period.

Today the railway investment in Florida is more than two and one-half times the value of all property in the state in 1880. This investment in 1936, according to the Railroad Commission of Florida, totaled, \$309,000,000.

Approximating the total value of all farm property in the state, this huge investment points to the important stake which the railroads have in Florida. It also points to the important stake which the people of Florida have in their railroads.

The value of railway transportation service to Florida is beyond calculation. The extensive fleet of long-distance, deluxe passenger trains which link Florida's numerous resort cities with Boston, New York, Philadelphia, Baltimore, Washington, Pittsburgh, Cleveland, Chicago, Detroit, St. Louis and scores of other great centers of population, are performing a service of inestimable value to the state.

Nor would it be possible to overstate



The Florida East Coast Bridge over the St. John's River

the importance of the service performed by the railroads in the transportation of Florida fruits and vegetables to distant consuming centers. Without the fast, dependable, and low-cost transportation service provided by the railroads, it would not have been possible for the fruit and vegetable industry of Florida to have developed to anything approaching its present proportions.

Railway transportation has broken down the barriers of distance. It has vastly extended the marketing areas of fruit and vegetable growers, and it has thus greatly increased the variety of food available to the average household. Thanks to fast refrigerator express service, millions of American families throughout the United States and Canada enjoy an abundance of fresh Florida fruits and vegetables throughout the winter months. Perishable railway transportation adds many millions of dollars annually to the farm income of Florida, and good railway service has helped to de-

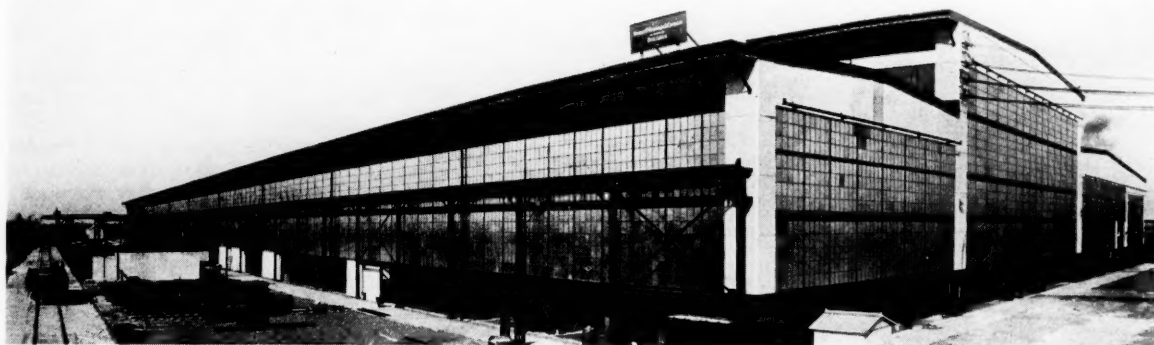
velop numerous industries in the agricultural areas of the state.

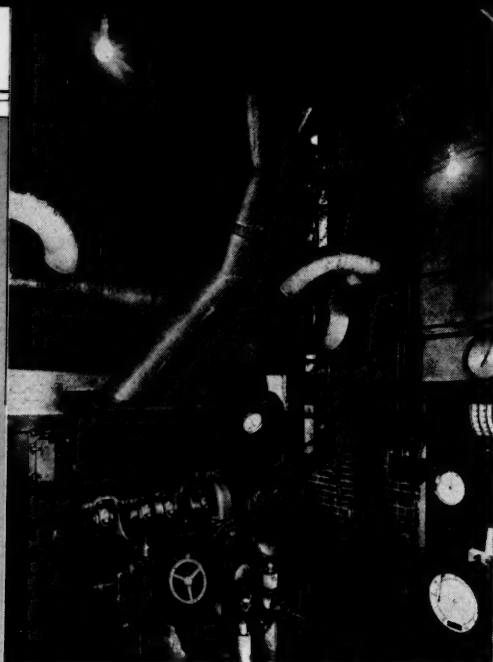
Some idea of the extent of this service may be gained from the fact that more than 82,000 carloads of fruits and vegetables were shipped from the state during the year ended June 30, 1937, for consumption in every state in the Union and several provinces of Canada.

Perishable fruit and vegetable transportation and passenger train operations represent only a part of the daily service which the railroads are performing for Florida. When we consider what railway service means to the lumber and naval stores industries, the phosphate industry, and to various other enterprises of the state, and the valuable service which the railroads perform in the transportation of building materials, merchandise, express and mails, we must realize that they are rendering services which no other form of transportation is capable of rendering to the people of Florida.

(Continued on page 54)

A complete modernly equipped railroad shop plant is the Tampa shop of the Atlantic Coast Line Railroad





New boiler, stoker and control panel installed in space previously occupied by Scotch Marine boiler

BY

B. G. Slaughter

President, Slaughter, Saville & Blackburn, Inc., Consulting Engineers, Richmond, Va.

EVERY man who is in responsible charge of a plant is faced with the necessity of reducing expenses in every way possible in order to meet keen competition and maintain profit. For the most part it has been the custom to look to labor saving devices which has been made necessary by increasing wages and shorter hours.

One of the greatest sources of potential savings has not had the attention it deserves and it is the purpose of this article to bring out the large possible savings in the steam power department. It is safe to say that any plant requiring power and process steam or hot water, which was designed more than ten years ago has a large possible saving; probably more than from any other investment which might be made. This is because the method of producing and using steam has made such progress during the past ten or fifteen years that it has rendered obsolete practically all steam power plants built prior to that time.

Probably the best illustration is to take an example of a rather well designed plant of about that age and one which has been so well managed that it has always been profitable.

This particular plant uses electric power, process steam and hot water, requiring approximately 15,000 pounds of steam per hour, 600 kilowatts of electric power and 120,000 pounds of process

The Advantages of Modernizing Industrial Power Plants

water per hour which is required at varying temperatures up to 140 degrees Fahrenheit.

The power equipment comprised two units. One of these was a 250 H.P. Scotch marine type boiler supplying steam to a 340 H.P. Corliss engine directly connected to a 200 kilowatt generator. The steam pressure was 125 pounds and the engine ran condensing with a surface condenser. Cooling water, after picking up heat from the steam condensed, was used for process water. The condensate was pumped to a hot water receiving tank referred to later. The other unit was a 475 horse power water tube boiler, supplying steam to a 394 horse power Ridgway engine, directly connected to a 250 kilowatt generator with steam pressure 180 pounds. This engine ran against a back pressure of from 10 to 25 pounds exhaust which supplied process steam. Any excess steam or any steam of higher pressure required for the process was taken as live steam from the boiler of this unit. The condensate from process steam, and from the condenser of the first unit was pumped to a central hot water tank, from which boiler feedwater and process hot water were taken. There was always an excess over boiler feedwater requirements, due to the necessity of introducing relatively cold water into the condensate from process equipment to prevent flashing.

From the description above it will be seen that the plant was designed with a view of using steam and hot water with a minimum of loss with the equipment available when it was built. It is not what one would call an old plant, and certainly not a poorly laid out plant for its time.

Records show that the plant used a considerable amount of electric power in excess of that generated and that the cost of this power was approximately half the cost of all coal consumed.

A preliminary study showed that installation of modern equipment should give all required steam and hot water, and the entire requirement of electric power with less coal and that of a cheaper grade.

The first step was a thorough study of all the requirements under the various

operating conditions and based on this to prepare an accurate heat balance for the minimum and maximum conditions. With this information it was possible to select the proper size and design of equipment to meet existing conditions with a reasonable allowance for increased production.

The problem was complicated, however, by the restricted space available for new equipment. It was necessary to use the existing boiler room and the space occupied by the Corliss engine and generator for any and all new equipment. The immediately apparent advantage of leaving the old water tube boiler for a spare made it necessary to select a boiler which could be set, with all its auxiliaries, in the space occupied by the Scotch Marine boiler, using the space on the second floor above it and a basement under it. While this greatly restricted the types of boilers available, the boiler eventually installed was of the highest efficiency of any on the market of the size selected, regardless of dimensions.

Calculations showed that a 400 H.P. boiler operating at 450 pounds working pressure with 100 degrees superheat was required. In order to furnish water suitable for high pressure work, an open type deaerating feedwater heater was selected but working under a low pressure so as to maintain a temperature of 225 to 230 degrees. This heater is supplied from an overhead hot water tank, with automatic valve controlling the makeup. Exhaust from the boiler feed pumps and auxiliaries furnish steam for the feedwater heaters. A four retort continuous ash discharge stoker was selected with steam turbine drive and with draft fan driven by motor. An automatic damper control, automatic feedwater control and carbon dioxide indicator, as well as indicating and recording steam flowmeter, and coal meter were installed. Feedwater pumps for a boiler of this size presented a problem, as the customary design used for high pressure would be prohibitive due to low efficiency, for a boiler as small as this. After much study, standard piston pumps designed for an entirely

different service, were selected. With a change in valve design these have worked very efficiently. A very simple track hopper, elevator and overhead bunker supply coal to the stoker and cinders are removed by a plain chain elevator, all of standard design fitted to the existing requirements. Steam for the boiler feed water pumps is taken from the steam line to the turbine through a reducing valve and desuperheater to work at 200 pounds pressure. All other steam generated goes to a 750 kilowatt 425 pounds working pressure turbo-generator designed to exhaust against a back pressure of from 20 pounds to 45 pounds as required by the process. All process steam and steam for heating water is taken from this exhaust line and the turbine is controlled by the amount of steam required in this line at the predetermined pressure at any time. Water may be heated in a closed heater or by live steam, or by both. The generator is connected up in parallel with the supply line from the power company so that if insufficient current is being generated, the additional amount is supplied by the Power Company. If more power is generated than required, it goes to the Power Company's line through a meter and is paid for by the Power Company.

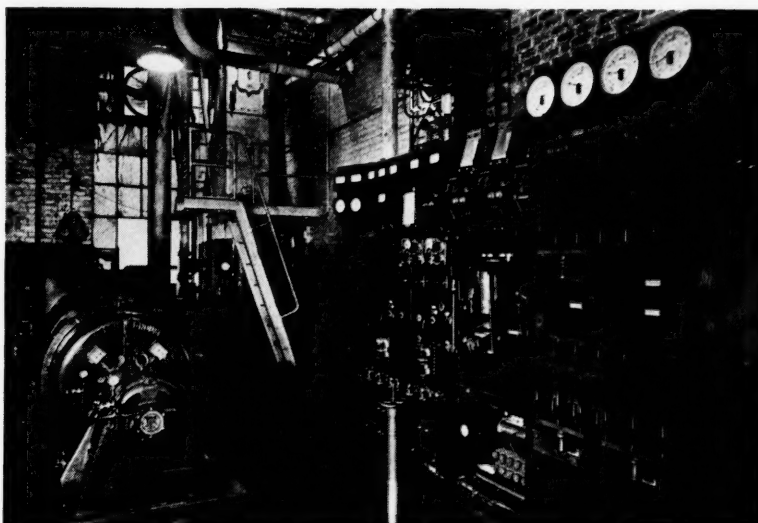
A plant running 24 hours per day cannot be tied to one source of power, no matter how reliable. To save the expense of duplicate equipment, the old water tube boiler was left in as an emergency supply of steam and the arrangement outlined above for stand-by electric power from the Power Company was negotiated. The cost of this stand-by power is much less than interest and depreciation on duplicate units.

It is not profitable to generate any considerable amount of excess power beyond that produced by the steam required for process purposes and heating water. Calculations indicated that this balance would be rather close and operation has proved this to be the case. Power from the line has been much less than that allowed by the cost of stand-by service and that returned to the line is yielding about \$100.00 per month.

The total cost of alterations will fall between \$85,000 and \$90,000.

The calculated savings were as follows:

Coal	\$14,000
Power	23,000
Labor	5,000
Less:	\$42,000
Cost of Stand-by Service	4,000
Credit for Power Sold	1,000
Net Cost of Stand-by Service	3,000
	\$39,000



Turbo-generator and switchboard installed in the old Corliss engine room

Less:

Interest—5% ..	4,500
Depreciation—	
5%	4,500 9,000

\$30,000 per Year

The method of handling coal and cinders was rather crude. The new installation has taken care of this, enabling the company to dispense with six laborers, making the labor saving slightly more than calculated. Repairs during the first five years will certainly be less than with the old arrangement, therefore it will be seen that, after providing for interest and depreciation, the plant will pay for itself in three years and the company will enjoy a very substantial reduction in cost for the entire future.

Operation of the plant has demonstrated how closely the calculations were made. All differences, which are not large, are on the conservative side and actual operation is showing results better than estimated.

While all plants may not have the advantage of such good balance between heat units and electrical requirements, it must be remembered that, after all, the process of manufacture is the important item and this plant had to be laid out with such flexibility as to meet the widely varying demand. For this reason the control devices, heat exchangers and other auxiliary equipment had to be much more intricate than is usually required. It is a function of the engineer to determine exactly what degree of refinement is justified and have no more and no less than will show maximum saving.

The retaining of consulting engineers is essential to determine the possibilities and advantages of modernization and is

no reflection on plant engineers. The plant engineer's knowledge of his plant and cooperation is of the greatest value and necessity to the consulting engineer, but his time is, and should be, taken with the many details of the entire plant. If then he is required to give the great amount of time necessary to gather all information and then make a study of all the latest equipment available, it is more than likely that other important matters, which only he can handle, will suffer, at an ultimate cost beyond the fee paid to engineering specialists.

Well Done

In conferring an honorary degree of Doctor of Engineering upon George M. Verity, Chairman of the American Rolling Mill Company, the Stevens Institute of Technology paid a merited tribute to this outstanding industrialist. The citation was as follows:

"George Matthew Verity: founder, President and now Chairman of The American Rolling Mill Company, a manufacturer who developed a small sheet metal shop on the river front of Cincinnati into a great independent unit of the steel industry, employing up to eighteen thousand workers; an industrial administrator who, knowing men as well as materials, has conducted the human affairs of his company with such justice and consideration no disagreement has ever arisen between management and men; an author whose chief published work is a code of fair dealing; a good citizen loved in his community, trusted in his factories, and respected throughout American industry."

June's \$68,679,000 Contracts Highest in Ten Months

CONSTRUCTION activity accelerated throughout the sixteen Southern states during June as contracts rose to \$68,679,000, according to tabulations prepared from reports published in the daily issues of CONSTRUCTION.

A fifty-three per cent increase over May brought the month's total to the highest level for any month in the last ten, with the prospects for further rises greatly strengthened by release of Federal funds for numerous government projects throughout the South.

Street, highway and bridge contracts aggregating \$21,512,000 not only were double the value for the preceding month, but represented the best total for this type of construction within a twelve-month period. Industrial and engineering contracts totaled \$21,405,000, as compared with the \$9,844,000 of the preceding month and the \$20,159,000 for June of last year. Private building is about seven per cent ahead of June of 1937. Governmental contracts in the current June have slowed down about thirty-nine per cent from awards in this field for the corresponding month of the year before.

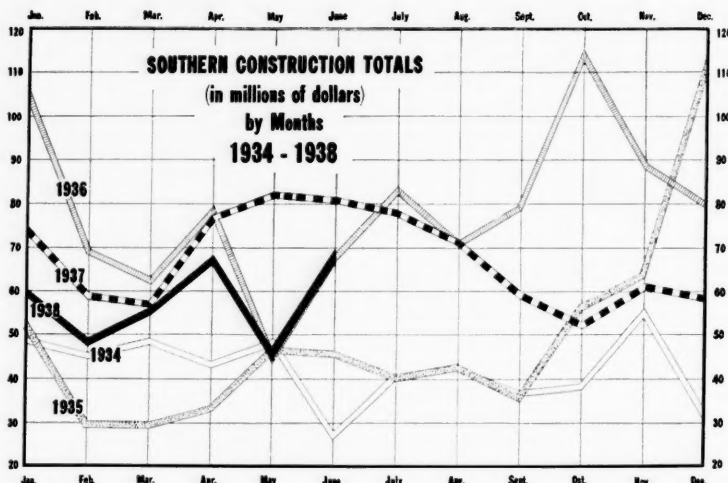
Contracts during the first six months of this year are approximately twenty per cent lower than for the same period in 1937. All of the loss has been in public

building work, highway and bridge construction and industrial and engineering projects. Private building showed a gain. The \$92,161,000 for such buildings, which with industrial plant construction represent most all of the private work initiated, now stands one-half of one per cent ahead of the figure for the first six months of 1937. Apartment and hotel, bank and office, church and store contracts showed an upward trend; association and fraternal and dwelling contracts

falling during the current half year.

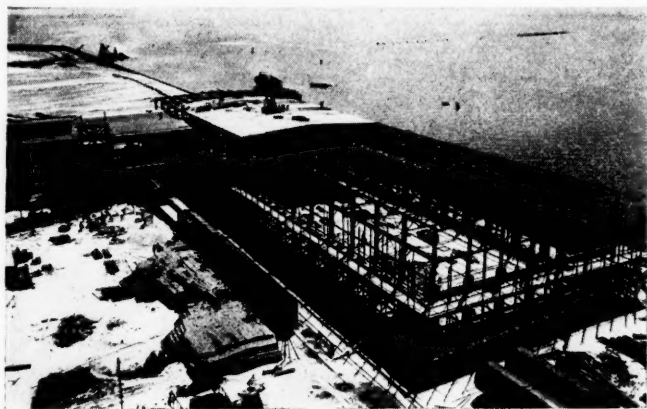
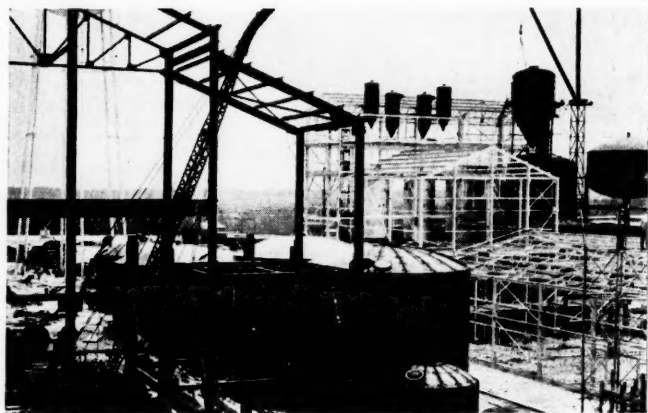
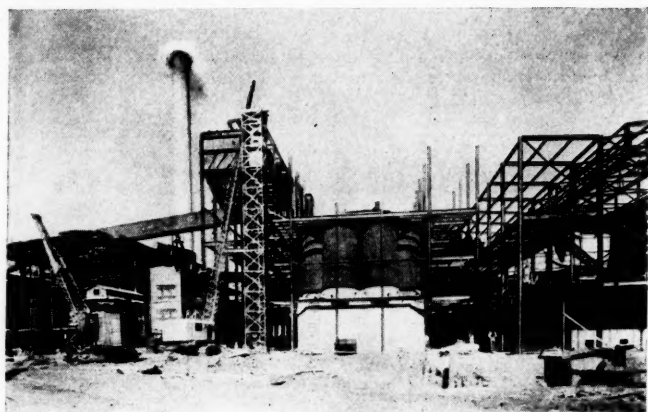
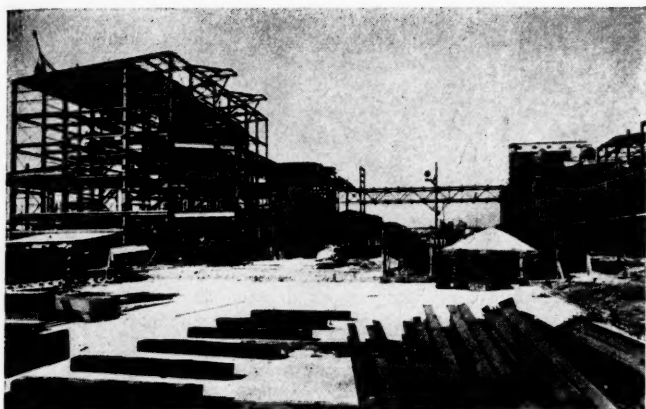
June's industrial and engineering total was swelled to its increased proportions largely by several important projects. The Grand River dam construction job in northeast Oklahoma was the most important. Three of the main contracts were awarded. These totaled \$10,661,000. The construction work is covered under a \$9,322,000 contract with the Massman Construction Co., of Kansas City, Mo.

(Continued on page 36)



Statistical Comparison of South's Construction

	Contracts Awarded June 1938	Contracts Awarded June 1937	Contracts to be Awarded June 1938	Contracts to be Awarded June 1937	Contracts Awarded First Six Months 1938	Contracts Awarded First Six Months 1937
GENERAL BUILDING						
Apartment and Hotels	\$3,948,000	\$3,066,000	\$2,036,000	\$5,394,000	\$20,735,000	\$18,408,000
Association and Fraternal	229,000	98,000	378,000	365,000	1,239,000	1,324,000
Bank and Office	505,000	552,000	1,492,000	1,347,000	7,244,000	5,009,000
Churches	1,043,000	478,000	1,032,000	855,000	3,832,000	2,129,000
Dwellings	5,350,000	6,235,000	13,164,000	5,510,000	39,204,000	46,976,000
Stores	3,485,000	3,078,000	3,104,000	2,673,000	19,907,000	17,831,000
	\$14,560,000	\$13,507,000	\$21,206,000	\$16,144,000	\$92,161,000	\$91,677,000
PUBLIC BUILDINGS						
City, County, Government and State	\$8,759,000	\$11,653,000	\$15,627,000	\$21,782,000	\$41,758,000	\$56,314,000
Schools	2,443,000	6,679,000	17,784,000	14,119,000	26,825,000	24,031,000
	\$11,202,000	\$18,332,000	\$33,411,000	\$35,901,000	\$68,583,000	\$80,345,000
ROADS, STREETS and BRIDGES	\$21,512,000	\$28,815,000	\$37,648,000	\$67,320,000	\$89,982,000	\$98,436,000
INDUSTRIAL and ENGINEERING						
Drainage	\$1,553,000	\$1,212,000	\$34,498,000	\$7,118,000	\$11,300,000	\$12,962,000
Filling Stations and Garages	660,000	448,000	230,000	398,000	2,952,000	3,077,000
Industrial Plants	16,832,000	16,757,000	26,023,000	42,176,000	66,226,000	125,260,000
Sewers and Waterworks	2,300,000	1,742,000	13,424,000	3,920,000	12,552,000	17,654,000
	\$21,405,000	\$20,159,000	\$74,175,000	\$53,612,000	\$93,030,000	\$158,953,000
TOTAL	\$68,679,000	\$80,813,000	\$166,440,000	\$172,977,000	\$343,756,000	\$429,411,000



JULY NINETEEN THIRTY-EIGHT

Paper Becomes A Southern Crop

Using Southern slash pine, a very fast growing wood, the Paper Industry is pointing to the South as an important and permanent factor for the future production of paper and woodpulp.

A number of large plants have been built and more are to follow.

As usual Virginia Bridge has had a large part in this construction just as it has had in Southern bridge and building construction generally for more than 40 years.

VIRGINIA BRIDGE COMPANY

Roanoke Birmingham Memphis Atlanta
New York Dallas

VIRGINIA BRIDGE

Four paper mills in a row—for which Virginia Bridge recently furnished the steelwork, more than 14,000 tons—reading from the top down:

1. West Virginia Pulp & Paper Co., Charleston, S. C.
Morton C. Tuttle Co., Boston, Gen'l Contr's.
2. Union Bag & Paper Corp. of Ga., 2nd & 3rd units,
Savannah, Ga. Merritt-Chapman & Scott Corp., New
York, Gen'l. Contr's.
3. Brunswick Pulp & Paper Co., Brunswick, Ga.
Stone & Webster Engineering Corp., Boston, Gen'l.
Contr's.
4. St. Joe Paper Co., Port St. Joe, Fla.
James Stewart & Co., New York, Gen'l. Contr's.

June's \$68,679,000

Contracts

(Continued from page 34)

Westinghouse generators and Allis-Chalmers turbines are to be installed.

The Government Printing Office annex to be erected at Washington was another of the outstanding awards. It will be built by McCloskey & Co., of Philadelphia, and will cost \$4,291,000. A \$518,000 contract let to the Central Construction Co., by the City of Dallas for additions to the local sewage treatment system, together with a \$187,000 award for stone for the filter beds was among the prominent projects in the municipal utility field. Important municipal electric projects centered around the Tennessee cities of Memphis, Knoxville and Chattanooga, as cooperative power line projects proceeded in rural areas.

The Houston Lighting and Power Co.,

of Houston, Tex., now has a \$2,000,000 expansion program well advanced, a piling contract having just been awarded. A big privately owned hydro-electric project to cost in the neighborhood of \$6,000,000, with \$2,000,000 of the expenditure to be made for flood control features financed by the Federal Government will probably soon go ahead on the Ouachita River. It is to be located at the Blakely mountain site northwest of Hot Springs, Ark., and is to be built under supervision of the Arkansas Power & Light Co.

Construction is to be started immediately on a new plant at Mobile, Ala., for the American Cyanamid & Chemical Corp., which has purchased a site from the Alabama State Docks Commission there. A second new southern plant will be established at Savannah, Ga., by the same corporation. An early start is scheduled for the \$7,500,000 newsprint

plant at Lufkin, Tex. Ground will be broken for the project, which is to be carried out by Southland Paper Mills, Inc., on July 15.

Sears Roebuck & Co., which now has its \$1,500,000 store at Baltimore well along toward completion, received bids for a similar building at San Antonio, the cost of the latter to be \$500,000. A Dallas group, including Charles E. Logan, are preparing to start an \$800,000 apartment project. The Suburban Development Co., of Atlanta, made the award for dwellings in a new \$800,000 subdivision. A storage and distributing plant to be erected at St. Louis, Mo., by the Steel Sales Corp., will cost approximately \$125,000. Koppers Coal Co. made the \$250,000 award to R. H. Hamill Co., of Huntington for erection of 100 dwellings to be occupied by the miners to be employed at the new mine being opened at Kopperston, W. Va.

Representative Projects in South Last Month

Contracts Awarded

Ark., Little Rock—Board of Public Affairs Municipal auditorium; William Peterson, Contr.	6684,000
Ark., Little Rock—U. S. Engineer Office Levee Embankment; Fred Luttjohann, Topeka, Kans. (low bidder)	237,000
D. C., Washington—St. Elizabeth's Hospital Treatment building, connecting corridor; John McShain, Baltimore, Md., Contr.	293,000
D. C., Washington—Government Printing Office Annex No. 3; McCloskey & Co., Philadelphia, Pa., Gen. Contr.	4,372,000
Elevators; Montgomery Elevator Co., Moline, Ill., Contr. D. C., Washington—Cafritz Construction Co.	288,000
Apartment	256,000
D. C., Washington—Chevy Chase Park & Shop Stores, Inc. Building, Kays Realty Co., Contr.	200,000
Fla., Pensacola—Bureau of Yards and Docks Runways, (Corry Field); Smith Engineering & Construc- tion Co., Contr.	118,000
Ga., Atlanta—Suburban Development Co. Dwellings; G. & L. Construction Co., Contr.	800,000
Ky., Catlettsburg—Ashland Oil & Refining Co. Expansion program	500,000
Md., Baltimore—South Baltimore General Hospital Addition; Price Construction Co., (low bidder)	200,000
Mo., St. Louis—Steel Sales Corp. Plant; L. O. Stocker Co., Contr.	150,000
N. C., Raleigh—Dr. James R. Rogers, Hillsboro Office building; James A. Davidson, Contr.	125,000
N. C., Statesville—Treasury Dept. Post office and courthouse; A. Farnell Blair, Lake Charles, La., Contr.	167,000
Okl., Pensacola—Grand River Dam Authority Dam; Massman Construction Co., Kansas City, Mo., Contr.	9,322,000
Turbines; Allis-Chalmers Manufacturing Co., Milwaukee, Wis.	650,000
Generators; Contr. 6 Westinghouse Electric & Manufac- turing Co., East Pittsburgh, Pa., Contractor	679,000
Okl., Vinita—Eastern Oklahoma State Hospital Dining hall; Tankersley Construction Co., Oklahoma City, Contr.	120,000
Tenn., Knoxville—City Overhead distribution system; Federal Engineering & Construction Co., Kansas City, Mo., (low bidder)	420,000
Tenn., Memphis—William R. Moore School of Technology Building; S. & W. Construction Co., Memphis, Contr.	169,000
Texas—U. S. Engineers, Galveston Dredging Ship Channel; Atlantic, Gulf & Pacific Co., New York, (low bidder)	242,000
Tex., Dallas—City Filters, etc.; Central Contracting Co., Contr.	518,000
Tex., Fort Worth—City Library superstructure; A. Farnell Blair, Lake Charles, La., (low bidder)	232,000
Tex., Houston—Firestone Tire & Rubber Co. Building addition; P. M. Marshall, Contr.	500,000
Tex., Mercedes—Magie Electric Co-Operative, Inc. Power line; P. E. Workman, Dallas, Contr.	200,000
Va., Langley Field—Constructing Quartermaster Runways and drainage; Roberts Paving Co., Salisbury, Md., (low bidder)	251,000
Va., Norfolk—Bureau of Yards and Docks Dredging (Naval Operating Base); Norfolk Dredging Co., Contr.	158,000
Landfill field improvements; E. D. Cline & Leon Ellis, Greensboro, N. C., (low bidders)	236,000
Va., Williamsburg—Eastern State Hospital Ward buildings; Harwood Construction Co., Newport News, Contr.	119,000

Proposed Construction

Ala., Tarrant City—Birmingham Water Works Expansion program	400,000
Arkansas—U. S. Army Engineers	400,000
Flood control works	3,817,000
Ark., Jonesboro—Arkansas State College Science building; McAninch & Anderson, Little Rock, Archts.	200,000
Ark., West Memphis—State Racing Commission Horse racing track	300,000
Fla., Miami—City Diesel plant (Hialeah pumping station); Carl F. Lambert, Const. Engr.	200,000
Fla., Miami—City, A. E. Fuller, City Manager Miami Port Island project	4,000,000
Fla., Tampa City Sewer, street, etc. improvements	750,000
Georgia—Army Engineers Flood control projects	927,000
Ga., Atlanta—Capitol Square Improvement Commission State office building; Constantine & Bradbury, Archts. La., New Orleans—Sewerage and Water Board Sewerage system extension	500,000
La., St. Bernard—St. Bernard Parish Courthouse and jail; Weiss, Dreyfuss & Seiferth, New Orleans, Archts.	1,575,000
La., St. Bernard—St. Bernard Parish Courthouse and jail; Weiss, Dreyfuss & Seiferth, New Orleans, Archts.	500,000
Md., Cumberland—City Water treatment and distribution plant	1,025,000
Md., Frederick—Frederick County School Board School buildings	545,000
Md., Hagerstown—Washington County Board of Education School construction program	290,000
Miss., Jackson—Memorial Commission War Memorial office building; E. L. Malvaney, Archts.	285,000
Mo., Kansas City—City, H. F. McElroy, City Manager Passenger station (Municipal Airport)	210,000
Mo., St. Louis—City Hospital improvements; Wm. C. E. Becker, Ch. Engr.	1,250,000
Mo., Springfield—City Remodel sewage disposal plant; F. M. Veatch, Kansas City, Engr.	500,000
Water Plant	5,000,000
N. C., Charlotte—Presbyterian Hospital Hospital building	800,000
N. C., Gastonia—Gaston County School improvement program	300,000
Tenn., Franklin—Tennessee Valley Authority Phosphate plant	500,000
Tex., Abilene—City Filtration plant improvements; Hawley, Freese & Nichols, Ft. Worth, Engrs.	400,000
Tex., Dallas—City Storm sewers	1,795,000
Tex., Houston—Tops Glass Co. Glass plant; Frazier-Simplex Engineers, Archts.	510,000
Tex., Houston—Houston Chronicle Remodel, install air conditioning	400,000
Tex., Houston—Board of Education School building; H. J. Jonas and Tabor, Archts.	250,000
Tex., Houston—Continental Supply Co. Plant; Harry E. Weaver, Archt.	250,000
Tex., Lubbock—Dr. J. T. Hutchinson and D. J. T. Krueger Office building; Wyatt C. Hedrick, Ft. Worth, Archt.	350,000
Tex., Fort Arthur—Southwestern Bell Telephone Co. Building	500,000
Va., Richmond—Virginia Museum of Fine Arts Wing addition	275,000
W. Va., Madsville—Christopher Mining Co. Open mine	500,000

SAVE with the ECONOMY of INTERNATIONAL POWER



"Indispensable", says the Belknap Hardware Co., Louisville, Ky., about their International I-12 Industrial Tractor. This small, compact unit works in their shipping room and hauls between buildings. They report that it only uses four gallons of gasoline in eight hours.

When costs pinch profits, look to your power and your power work methods. Many business men have swept away serious handicaps by scrapping obsolete equipment and methods and re-equipping with International Power. If you say the word, an International Harvester representative will go over your power needs with you and make recommendations that can easily save you many dollars.

International Power (gasoline, Diesel, and gas) is available to industry in four distinct forms: (1) Power Units, (2) Crawler Tractors (TracTractors), (3) Wheel Tractors, and (4) Modified Units. Each type is built in a wide range of sizes, permitting the choice of the proper power and capacity for each job. The Modified Units are supplied to

equipment manufacturers only, and are always sold as integral parts of high-grade equipment.

When in need of power or power-operated equipment, look for the International Harvester nameplate—it is your assurance of full power, high quality, and adequate service. International dealers and Company-owned branches have had a great deal of experience with heavy-duty equipment. They know the service needs of machines that do the world's hard work and are equipped to back up every sale to the user's complete satisfaction. Complete information on any type of power equipment will be sent on request.

INTERNATIONAL HARVESTER COMPANY
(Incorporated)
180 North Michigan Avenue Chicago, Illinois

INTERNATIONAL Industrial Power

Iron, Steel

and Metal



Market

THE cut in steel prices in June was followed by a reduction of \$4 a ton in the price of pig iron in the Birmingham district. The wiping out of the differential, created by the basing point plan applying to steel and in effect for so many years, should be a spur to greater activity throughout the South. The general opinion is buyers will take advantage of it.

Southern construction as referred to elsewhere in this issue, has already made a notable advance in June, representing the highest total of contracts awarded for any month of the last ten.

Railroads, which are experiencing a slight upturn in revenue as carloadings have improved, will doubtless take the opportunity to fill some of their needs.

The effect upon wages is yet to be determined. Some authorities hold to the opinion it is impossible to maintain the present high rate and take orders at the lower price schedule without suffering a loss. The report that the United States Steel Corporation has given assurance that wage reductions would not follow price reductions has been denied. It is probably safe to believe, however, that irrespective of what changes, up or down, may take place in the price structure, Birmingham prices will be quoted hereafter without "Pittsburgh plus." The fairness of this is evident, especially in view of higher freight borne by Southern products moving into other sections.

Sharper changes have been made in steel prices at various times in the past, and there is no doubt of the fact that buyers have been waiting for some move, not only in the automobile industry which is such a large purchaser of steel, but in other lines, to tempt consumers to increase their purchases. After a study of the situation, many who are competent to express opinions, believe that steel as the barometer of business, started something that will have a far-reaching effect.

Producers plants have never been in more complete and up to date condition to turn out both quantity and quality of product, and with steel moving forward to better things it may be anticipated that other lines will follow.

Steel operations at Birmingham dropped to 42 per cent, with the outlook favorable to at least a continuance of production at that rate for the next quar-

ter. There is no doubt of the better feeling prevailing in Birmingham and other parts of the South, reflected in improved construction activity as referred to above, and also because of the huge amounts to be spent for public improvements of various kinds included in the pump priming under government's lending-spending program.

Late news reports indicate National Steel Corporation as quoting a \$2.00 a ton differential for automotive steel at Detroit, over other centers, by the Great Lakes Steel Division of the company. This is said to represent a cut of \$2.00 a ton from the differential for hot and cold rolled sheet and strip formerly prevailing over Pittsburgh, and with base prices cut at that city by \$3.00 a ton, the resulting saving to automotive manufacturers is estimated at \$5.00 a ton.

Some of the larger independents, such as Youngstown Sheet & Tube Co., at the time this is written, have made no price announcement, while some of the smaller independents are complaining they will not be in a position to cover the consuming market they formerly reached if they have to quote f. o. b. mill.

Other commentators on the probable effect of reduction in prices predict that several weeks will have to elapse before adequate opinion on the effect of the move can be formed. The effect in the South, however, it is believed will be definitely beneficial. The South has been moving forward during years of depression. Its resources for manufacturing in varied lines, and in close proximity, are more generally recognized than ever in the past. There has been a steady increase in the total of investments by privately owned enterprise, and already the list of plants, which are the largest of their kind in the world, is a long one.

The textile trade has largely moved to the South and the chemical industry is increasing its investment tremendously.

Space will not permit a review in this column of the evidences on all sides—that the Southern states have an industrial frontier destined for truly great development which is a reality and not a dream. In some quarters there has been jealousy of the South. In New England one governor called a meeting of business interests to protest the South asking for

freight rates enabling it to ship its goods on an equality with freight rates charged other sections. The abolishment of a basing point for steel is a recognition of the South's right to compete on equal terms.

According to the Wall Street Journal, announcement is expected soon of a new design of light-weight high-tensile steel hopper car which can be produced around the same cost as similar cars of carbon steel, and with a material saving of weight. It is said that this will be the first time a light-weight freight car constructed by standard methods, has been developed at the same price as for a carbon steel car. The Pullman Company recently introduced a light-weight box car to sell at the same price as standard equipment. This product, however, is welded, while the new car, it is understood, will use ordinary riveting.

The American Railway Car Institute is working with the United States Steel Corporation on the design. It is said that Cor-ten steel will predominate in the car's equipment. This is the material principally used in the new Pullman cars used on the new trains of the New York Central and Pennsylvania Railroads. On the Twentieth Century Limited by use of this product and other light-weight materials, weight was reduced about one-third, and it is expected fuel consumption will be reduced from 10 to 15 per cent.

Similar types of steel are offered by other leading makers, such as Youngstown Sheet & Tube Co., and Republic Steel Corporation.

The total output of Cor-ten in 1937 was 60,000 tons. It was first made in 1934, when the output was 1,680 tons. The United States Steel Corporation has been expanding its usage of the material and now has 19 types for various purposes, such as dams, barges, roofing, etc.

As June drew to a close, scrap prices advanced 50 cents a ton to \$12.50 at Pittsburgh, with some dealers holding out for \$13.00.

Domestic copper, following higher quotations abroad, rose to 9½ cents, and scrap copper to 7¾ cents.

Lead advanced also \$5.00 a ton in the last week of June, with prices at 480 cents a pound, New York delivery, and 440 cents a pound at St. Louis.

The zinc market has likewise been active, with prices ranging from 4 cents to 4½ cents a pound at East St. Louis.

We want you to meet two friends of ours—

I'M KEN KEEN, AND I'M JUST AS SHARP AS MY NAME WHEN IT COMES TO BUYING STEEL FROM A WAREHOUSE. THAT'S WHY A JONES & LAUGHLIN WAREHOUSE GETS ALL MY BUSINESS.



AND I'M WILL WISE, AND I KNOW ENOUGH, TOO, NOT TO TAKE CHANCES ON BUYING QUESTIONABLE STEEL FROM BARGAIN COUNTER SOURCES. I RELY ON A JONES & LAUGHLIN WAREHOUSE FOR KNOWN QUALITY STEEL AND SERVICE WHICH SAVES ME TIME, TROUBLE AND, IN THE END -- MONEY.



Jones & Laughlin Warehouses are established in order to supply you with steel requirements not economically purchasable from the mills, and to give you fast, money-saving service. Each J & L Warehouse carries "known quality" steel products obtained directly from the J & L mills, so that you, the customer, need have no fear that seconds or rejected materials may be included in your order. Complete records are kept of the grade, chemical analysis and physical properties of each shipment, so you can be sure you're getting the right quality of steel every time.



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Operated by Jones & Laughlin Steel Service, Inc., formerly National Bridge Works

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Lumber



News of the Month

Increased Output of Lumber

On the basis of weekly average production in 1929 the lumber industry for the last week of June stood at 58 per cent, which is the highest yet recorded in 1938, and was 3 per cent higher than the preceding week.

Although new business and output were considerably below the corresponding period of last year, the continued upturn in new orders is a factor more favorable than at any period since the early part of March, 1938.

Production by 526 mills during the week ended June 18 comprised 193,567,000 board feet of hardwoods and softwoods combined as against 190,017,000 board feet in the preceding week. Shipments were 185,319,000 board feet for the week ending June 18 compared with 190,498,000 board feet the previous week, while orders booked were 185,886,000 board feet and 185,780,000 board feet respectively.

Southern pine and Southern hardwood reported orders and shipments above production though below corresponding items for comparable periods in 1937.

The Southern Forest Situation

The situation with regard to the ability of Southern forests to support economically the industrial demands thereon, appears to be more optimistic than previously had been indicated by E. L. Demmon, Director of the U. S. Southern Forest Experiment Station, whose 17th annual report has recently been issued.

Though Mr. Demmon reiterates the necessity of additional reforestation and management of Southern forest lands, he concedes that they are capable of supporting virtually all industrial requirements the region may make of them.

With 38 pulp mills in operation or under construction in 10 Southern states from Virginia to Texas representing an investment of approximately \$200,000,000, the total reported capacity will be about 10,000 tons of pulp per day. This output will require about 5,000,000 cords of wood annually and will give employment to nearly 23,000 men in the mills and 16,000 men in the forests while the annual payroll will probably exceed \$25,000,000. This consumption will be nearly

double the quantity used in 1937.

These forests also have to support other industries, including naval stores and lumber, and in this connection, the report points out that the forests of the region will be able to meet all demands providing forest owners and managers use the various kinds and grades of timber for the purpose for which they are best suited and for which they will bring the most income. At the same time the forest capital, or growing stock should be built up and maintained.

One of the main objects of the Station's research program is to show how forest practices can be accomplished economically and satisfactorily for all wood-using industries concerned. The studies in forest economics include: (a) private forestry investigations to develop for Southern forests improved management methods economically sound and technically desirable from the standpoint of land use; and (b) taxation studies to learn as much as possible about the relation of land taxes to the possibilities of forestry on privately owned land.

The Forest Survey includes an inventory of forest lands and forest resources in the South. Its purpose is to supply information for the formulation of policies on forest-land utilization. The Survey found during the last year that of the 213,000,000 acres in the South for which statistics are available, about 59 per cent is classified as forest area. Of the cordwood volume, pines make up 48 per cent, and hardwoods 52 per cent. In most of the area, the average stand per acre is over 2,300 board feet. Expansion of the pulp and paper industry makes the compilation of such data especially important.

Naval Stores Production

According to the Naval Stores Research Division of the U. S. Department of Agriculture, production of turpentine and rosin in this country during the past year was the highest for several seasons. In spite of this increase however, the percentage of United States naval stores products continued to decline and now represent less than 54 per cent of world production compared with 80 per cent 30 years ago. Though world production has varied little as a whole, United States production has declined slightly through

the years. The contributing factor in the reduced percentage of American production is the phenomenal increase in Russia. Furthermore, it is reasonably sure that with annexation of Austria by Germany, the Reich will make every effort henceforth to supply its own requirements. At present Germany is our second largest importer of American naval stores products.

Production of naval stores products during the season April 1, 1937 to March 31, 1938, is as follows:

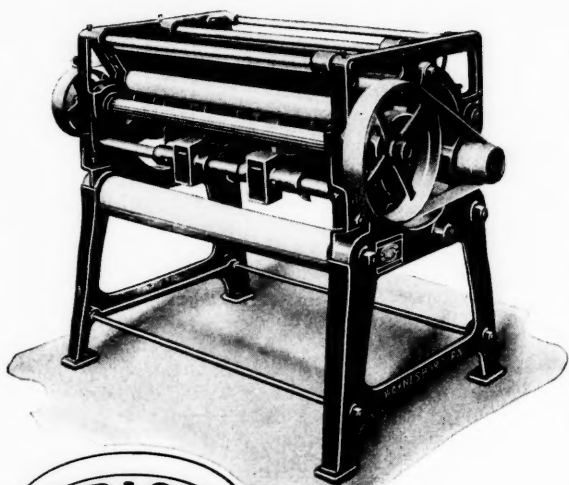
	<i>Turpentine</i> barrels of 50 gals.	<i>Rosin</i> barrels of 500 lb.
Gum	518,454	1,709,157
Reclaimed Gum .....	.....	26,271
Steam Dist. Wood	136,292	803,538
Sulphate Wood	38,500	23,000
Dist. Dist. Wood	7,085	.....
Totals	700,231	2,561,966

Gum production by states follows:

	<i>Turpentine</i> barrels of 50 gals.	<i>Rosin</i> barrels of 500 lb.
Alabama	50,030	168,363
Florida	136,846	436,366
Georgia	295,809	982,086
Louisiana	2,065	7,076
Mississippi	15,973	54,638
North Carolina	785	2,856
South Carolina	15,044	52,067
Texas	1,902	5,706
Totals	518,454	1,709,157

The available supply consisting of 223,364 barrels of turpentine and 663,251 barrels of rosin carryover at the beginning of the season and 14,335 barrels of turpentine and 336 barrels of rosin imported (chiefly from Mexico), together with domestic production gave a total availability of 938,030 and 3,225,553 barrels of turpentine and rosin respectively. Of this amount, disposal was as follows:

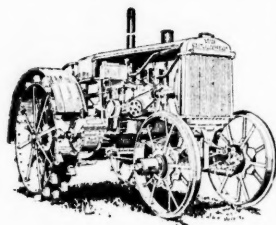
	<i>Turpentine</i> barrels of 50 gals.	<i>Rosin</i> barrels of 500 lb.
Exports	276,530	1,034,472
Domestic Consumption	442,726	1,191,734
Carryover March		
31, 1938	218,774	999,347
Totals	938,030	3,225,553



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Frick gang edgers are precision built. All parts of the husk have ball and socket joints which insure perfect alignment. All shafts are supported in pressure lubricated roller and ball bearings. These quality machines are built in two sizes and may be fitted with two, three or a gang of saws. The smaller size will accommodate boards up to 27 in. in width while the larger size has a limit of 32 inches. Extra long front and rear tables with ball bearing conveyor rolls are furnished as standard equipment.



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Harrisburg, Pa.	75 South Tenth St.	Atlanta, Ga.	712 Ponce de Leon Place
Easton, Pa.	3500 Wm. Penn Highway	Knoxville, Tenn.	123 State Street
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Good Roads and Motor Transport

Highway Construction and Grade Crossing Projects

During the fiscal year ending May 31, 1938, there were 3,221.6 miles of federal-aid highways completed in the sixteen Southern states at a total estimated cost of \$59,811,564 according to the U. S. Bureau of Public Roads. Texas ranked first with 967.8 miles involving an expenditure of \$14,755,214 and Missouri was second with 468.2 miles costing \$9,109,675.

As of the same date there were 2,946.7 miles of highways under construction, the cost of which is estimated to be \$76,885,997 while 1,451.5 additional miles have been approved for construction at an estimated cost of \$40,692,402.

In the same period, \$284,830 was expended for grade crossing projects, four crossings being eliminated and four reconstructed. Included among those now under construction are 35 eliminations and three being reconstructed, all at a total cost of \$1,826,161. The number of projects which have been approved is 65 and will cost \$2,683,925 it is estimated. These include 21 eliminations—Alabama 4, Arkansas 1, Kentucky, Louisiana 2, Maryland 1, Missouri, 2; North Carolina 4, South Carolina 2, Texas 1, and West Virginia 3. Two grade crossings will be reconstructed, one each in South Carolina and Virginia, and 42 crossings in four states, Alabama 6, Kentucky 31, South Carolina 2, and Virginia 3, will be protected by installation of signals or other similar means.

The balance of funds available for programmed grade crossing projects in the South amounts to \$29,633,417 and the comparable sum for highway projects is \$63,586,143.

Motor Vacationing Expenditures

Motor vacationing expenditures reached the all time record of \$4,500,000,000 during 1937, according to the final report dealing with last year's touring volume by the American Automobile Association. This was \$250,000,000 higher than the previous record established in 1936.

While gasoline consumption is running slightly more than one per cent above the amount for 1937 and the trend of travel routings is a little above last year, with state agencies predicting a small increase over last year's travel volume, nevertheless the effect of the depression during recent months is being felt and general

opinion is that the 1938 total expenditure will be noticeably less than in 1937.

Progress in the Use of Bituminous Road Materials

The United States report on progress in the preparation and use on roads of tar, asphalt and emulsions made by E. F. Kelley, Chief, Division of Tests, U. S. Bureau of Public Roads to the Permanent International Association of Road Congresses, has just been made public and includes a summary of the past few years.

During this time a great increase in the use of bituminous road materials has been made in the United States, particularly in the use of liquid products. In 1929 the total consumption of asphaltic road materials was 2,656,000 tons of which the slow curing liquid products and cut-back asphalts accounted for only 35 per cent. In 1936 these liquid materials constituted 63 per cent of a total consumption of 3,807,000 tons.

With respect to road tars, it is estimated that the annual consumption during the same period increased from more than 100,000,000 gallons to more than 150,000,000 gallons. The estimated consumption of asphaltic emulsions in 1936 is 56,000,000 gallons.

No changes of importance have been made in the specifications commonly used for the semi-solid asphalts known as asphalt cements or paving asphalts. However, the increased use of liquid bituminous materials has resulted in the development of new and more adequate specifications for these products.

In 1932 the U. S. Bureau of Public Roads cooperated with the Asphalt Institute in formulating a group of specifications for liquid asphaltic road materials of the slow curing, medium curing, and rapid curing varieties. These specifications were recommended to the State highway departments for adoption and, while the states as a whole have not adopted them in their entirety, they have had a marked influence on the specifications now in use. In 1933 the requirements of the recommended specifications for the medium and rapid curing cut-back asphalts were approved for inclusion in the specifications of the government.

The improvement and standardization of specifications for tar have been added considerably by the adoption in 1937, by the American Association of State High-

way Officials, of the Standard Specifications for Tar for Use in Road Construction. These specifications have been adopted in whole or in part by several states and their adoption, with modifications, is now being considered by the government. The important improvement in these specifications, compared with preceding ones, is in the establishment of twelve numbered grades through which the consistency increases from minimum to maximum.

Much interest is being shown in the proposal to specify viscosity requirements in terms of absolute units, both for tars and asphaltic materials, and a number of highway laboratories are investigating its possibility.

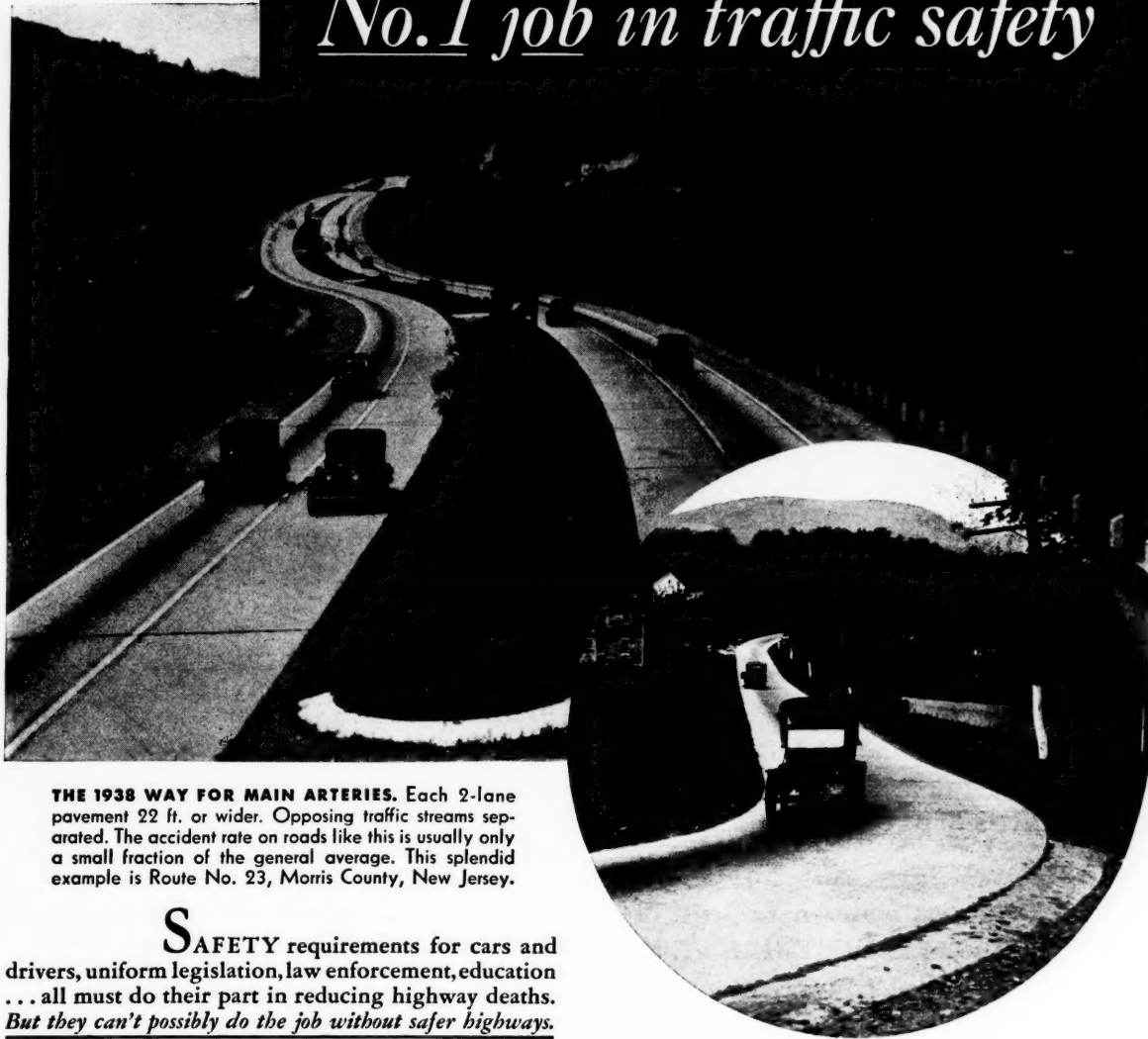
The slow-breaking mixing emulsions are being used to a considerable extent in densely graded bituminous mixtures but so far there are no standard specifications. In general, the requirements for these materials are similar to those for emulsions of the medium-breaking type except for demulcibility and addition of a mixing test to determine if the emulsion can be mixed satisfactorily with fine-grained material.

Emulsified asphalt for soil stabilization is a special grade differing from the others in that it must be capable of being mixed with large quantities of extremely fine soil materials of the clay size and it should dry rapidly after being mixed. In addition to the extensive use of these emulsified asphalts, there has been a limited use in this country of so-called inverted emulsions or emulsions of water in asphalt. However, their use has not been widespread and no effort has been made to propound, and standardization of requirements designed to insure their satisfactory quality.

In addition to the developments in specifications for the bituminous materials themselves, an important change has taken place in specification requirements for the coarse mineral aggregates with which they are used. This has been the rather general adoption of the Los Angeles abrasion test to replace the Page toughness test and the Deval abrasion test that have been standard for years.

The principal types of hot-mixed and hot-laid pavements in the United States are coarse aggregate asphaltic concrete, fine aggregate asphaltic concrete, and sheet asphalt. No essential changes have been made in recent years in the design and construction of these types, except in the increased use of improved construction equipment.

Safer highways— No. 1 job in traffic safety



THE 1938 WAY FOR MAIN ARTERIES. Each 2-lane pavement 22 ft. or wider. Opposing traffic streams separated. The accident rate on roads like this is usually only a small fraction of the general average. This splendid example is Route No. 23, Morris County, New Jersey.

SAFETY requirements for cars and drivers, uniform legislation, law enforcement, education . . . all must do their part in reducing highway deaths. *But they can't possibly do the job without safer highways.*

All too often much of the blame for accidents must be placed on the road itself. It was too narrow; opposing traffic streams were not separated; there was inadequate sight distance at danger points; visibility was poor; the road surface was skiddy, high crowned, bumpy, irregular, raveled at the edges, or otherwise unsafe and confusing—defects which highway engineers can eliminate if given adequate funds.

Here's what can be done about it:

- ① Design safety into highways by applying modern engineering principles.
- ② Set up a rational plan for highway development that will eliminate congestion and danger spots.
- ③ Provide adequate funds and stop diversion.
- ④ And build safe surfaces.

THE 1918 WAY. 16 ft. was the prevailing 2-lane width. Highway engineers here and there were already beginning to break the shackles of tradition. But fence-corner turns and other hazards were still common.

Concrete provides the safest, most uniform and dependable "track" for motor vehicles that modern engineering has yet devised. Permanently even-contoured—skid-resistant in wet weather or dry—more visible, day or night. And concrete is *economical*: Costs less to build than other pavements of equal load-carrying capacity; costs far less to maintain.

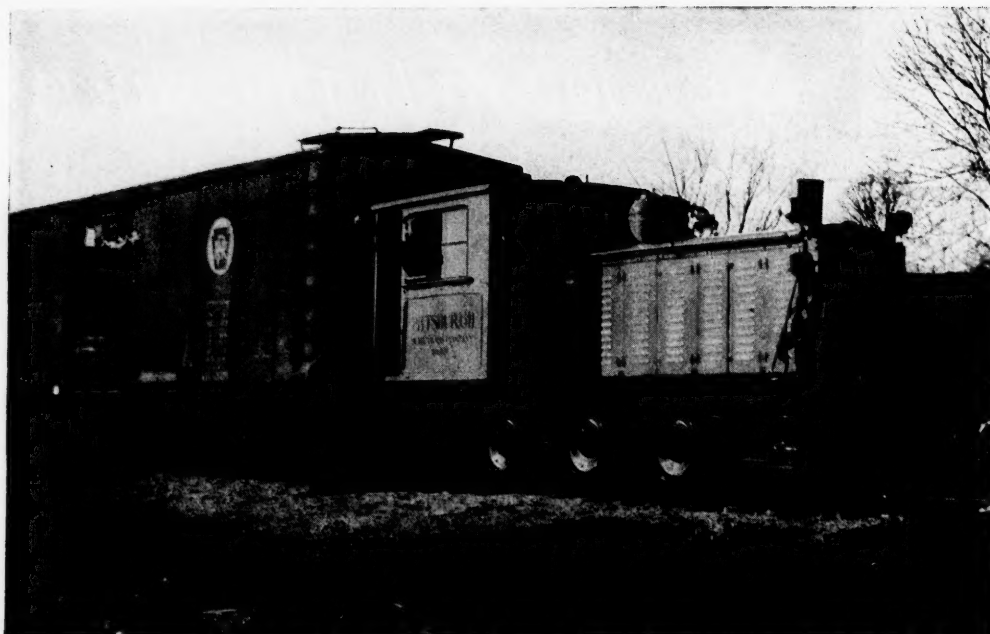
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1. Low first cost. No more than a gasoline unit.
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3. Use of INDUSTRIAL FUEL, usually cheaper than diesel fuel, and not attractive for tax purposes.
4. Remarkable performance.

Since Plymouth shipped the first Butane-Propane Locomotive in June 1935, Plymouth has delivered a total of 309 tons of Butane and Propane switchers.

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Malleable Iron in Oil Pumping Units

The Lufkin Foundry and Machine Company of Lufkin, Tex., manufacturers of oil field equipment, announce improvements in their new line of pumping machines, covering a number of control parts which are important from the standpoint of efficiency and durability, and involve conversions from complex structural assemblies to malleable iron castings. An example is the brake operating mechanism, illustrated herewith, which is composed of four malleable iron castings—one large quadrant, lever, pawl, and pawl release grip—all designed for specific functions at hand and to minimize assembly and machining work.



Lufkin Malleable Brake Assembly

Longest String of Welded Well Casing

Measuring 8,100 feet, the longest string of welded casing used thus far was recently set by the Carter Oil Company in the Carter-Harley No. 1 well near Milroy, Okla. Special casing made by the National Tube Company of Pittsburgh, Pa., 7-inch OD, 26-pound, range 3, was used, with two types of welded joints—the "U" bevel on plain end pipe and the "V" bevel commonly used on shorter strings. Welding equipment consisted of "Shield-Arc 85" electrodes and 300 ampere dual continuous control are welders supplied by The Lincoln Electric Company, Cleveland, Ohio. L. R. Hodell of the Carter Oil Company supervised the job, with Boris Robinoff and H. M. Cooley of the National Tube Company, and R. L. Looney, welding engineer for the Big Three Welding Equipment Company and Lincoln Electric Company, on the derrick floor. Upon completion, the casing was tested and de-

clared a success. It was inspected by H. W. Kirkpatrick, division superintendent, with Glen Howard, welding foreman of the Carter Oil Company, and Mr. Looney, to be sure that all welds had 100 per cent penetration and a neat appearance.

Jenkins U-Bolt Valve

In a definite effort to improve the design and construction of the U-Bolt Valve, Jenkins Bros., 80 White Street, New York, N. Y., announce new Bronze Mounted and All-Iron U-Bolt Gate Valves which have gained wide popularity where rugged general utility valves are desired. One unique feature of the new valve is a renewable "Bonnet-Saver-Bushing" that makes it unnecessary to junk the valve bonnet when operating threads are worn, and another advantage is that because this unique bushing can be lifted out the upper part of the chamber may be cleaned easily.

92-Foot Tower in Long Shipment

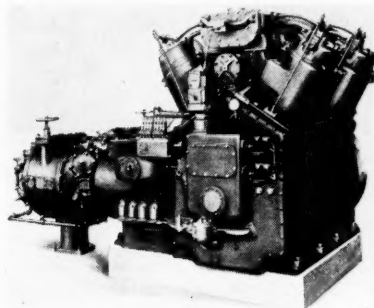
What is said to be the largest piece of industrial equipment ever made in St. Louis—a steel bubble tower 92 feet long, weighing 245 tons—was recently completed at the Heine Boiler Division plant of the Combustion Engineering Company, Inc., New York, N. Y., and shipped overland to Smith's Bluff, Tex., a distance of 916 miles, for use in the Pure Oil Company refinery. Special equipment, in the form of 400,000-pound capacity freight cars with 16 wheels each, was used. There are only four such cars in use in the United States, it is said. Shipments were handled by the Frisco Railway to Neosho, Mo., and from there by the Kansas City Southern Railway direct to the refinery. Heavy oak timbers cut to measurement at a logging camp in Southeastern Missouri were used to hold the tower on the cars, the timbers being arranged in swivels to permit the shipment to go around curves. The diameter of the tower at its widest part is 13 feet 2 inches. Firebox quality steel nearly 2½ inches thick was used to construct it, the tower and seams being welded by the electric fusion process.

National Power Show

The National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York, N. Y., outlines briefly, in a folder which it is distributing, why more than 200 manufacturers have already selected space for exhibits at the National Power Show to be held at Grand Central Palace December 5-10, 1938, as a "quick, economical and productive method of stimulating their sales," and suggesting that other manufacturers would find it profitable to engage space, which is still available, and arrange for an exhibit. This will be the 13th National Exposition of Power and Mechanical Engineering and will be held under the personal supervision of Charles F. Roth, Manager.

Cooper-Bessemer Type G-MV Compressor

At the recent Petroleum Exposition at Tulsa, Okla., unusual interest was manifested in the new Cooper-Bessemer Type G-MV Compressor Unit, the entire display including a Semi-Diesel pumping engine, 40-50 horsepower vertical compressor, small compressor for furnishing starting air, and a four-cylinder unit of the new Type G-MV Compressor. With a two-cycle, gas-engine-driven compressor combining V-type power cylinders set vertically, and compressor cylinders arranged horizontally, this new compact compressor is rated 100 horsepower per cylinder at a conservative speed of 300 rpm. It is the answer to the gas and oil industries' request for greater horsepower in smaller compressor units. The Cooper-Bessemer Corporation of Mt. Vernon, Ohio, builders of these new compressors, offer them in sizes of four, six and eight cylinders with a range of 400, 600 and 800 horsepower, respectively.



40-50 Horsepower Compressor Unit

Jaeger 3½s "Speedster" Mixer

As the latest addition to its line of end-discharge mixers, the Jaeger Machine Company of Columbus, Ohio, announces the 3½s "Speedster," a tilting type mixer which features the same type of air-cooled engine which has become popular on many Jaeger pumps. The 2½-horsepower plant is housed between drum and axle, making a very compact mixing unit. The machine is mounted on spring shock absorbers, Timken bearings and pneumatic tires, with detachable towing pole for fast trailing and easy maneuvering. Standard Jaeger construction is used throughout, including patented "V" Spot drum with cone of Man-Ten steel, mounted on Timken bearings. A feature of the machine, which is described in detail in a bulletin issued by the company, is that the end-discharge design saves hundreds of pounds in weight and is particularly convenient for backing up to foundations, windows or chuting.

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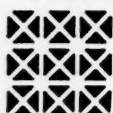
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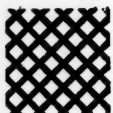
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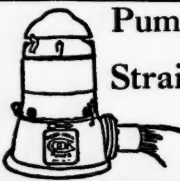
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Individual Tax Returns

The preliminary report of individual income tax returns for 1936, issued by the Treasury Department in the last week of June, contains some interesting figures.

There were 2,816,657 people who paid Federal income taxes. They paid on an aggregate net income of \$13,990,446,284, and their tax liability was \$1,203,897,961. The tax liability averaged \$427 for taxable returns, and the rate averaged 8.6 per cent.

The number of individuals making taxable returns increased by nearly 750,000, or more than 36 per cent, while the net income on these returns showed an increase of more than \$4,000,000,000, or 40.5 per cent.

Income taxes bore right heavily on those with big incomes, of which there were 14 in the class of from \$2,000,000 to \$3,000,000. The average net income in this class was a little more than \$2,500,000, and the average tax was \$1,863,000, or more than 73 per cent.

The Menace of Debt

In a statement issued by C. F. Childs & Co., which the New York *Herald-Tribune* says is the oldest house in the country specializing in government securities, the following appears:

"The continuing (budgetary) deficits vitally concern and should disturb every living American. There appears to be no disposition to balance the budget. The growing Federal debt chiefly affects the next generation. * * * The menace of those debts upon the next generation also depends upon the standard of money with which the debts may be paid. When the dollar was devalued to 59 cents, there was virtual repudiation of 41 per cent of the then existing debt. * * * The national debt constitutes a first mortgage on every one's assets and earnings. Debts of either governments or individuals can only be paid by sacrifices directly or indirectly exacted from labor, production, savings and thrift."

New Bank Examination Rules

The new bank rules decided upon by the Treasury Department, Federal Reserve, Federal Deposit Insurance Corporation and the Comptroller of the Currency, go into effect July 1. Under them loans will be classified by examiners hereafter by numbers 1, 2, 3 and 4. The old classifications of slow, doubtful and loss are to be abandoned.

Securities in a bank's portfolio are to be divided into separate groups designated by numbers. Until losses have been written off and adequate reserves established, the use of profits from the sale of securities will not be permitted.

Instructions are given at length in regard to investment regulations. The purpose of the new regulations, it is said, is to encourage borrowing and to make it easier for banks to add to their profit account. For some time member banks have had permission to carry government obligations owned by them at par instead of cost or at market. It is not known, however, that this has been generally adopted.

Bank Deposit Tax

The question of additional taxes has been a very prominent one in New York city in recent weeks. The city government has proposed various forms of new taxation besides those in effect in order to meet the relief problem and increasing expenses.

While not unexpected, the proposal of the city authorities to levy a tax on bank deposits has provided a hint on how far tax

(Continued on page 48)

THE BALTIMORE AND OHIO RAILROAD CO.

SUMMARY OF ANNUAL REPORT FOR THE YEAR 1937

The report of the Company's operations for the year 1937 is being distributed to the stockholders. It shows that total Railway Operating Revenues for the year were \$169,436,436. This was an increase over the previous year of \$443,755, notwithstanding the termination on December 31, 1936, of the emergency increase in freight rates and charges authorized by the Interstate Commerce Commission on March 26, 1935. Had these emergency charges been continued during 1937, freight revenues of the Company would have been about \$7,000,000 more than they were for that year. Despite this loss in revenue, and the increase in costs of operation, due to higher prices of material and fuel, and increases in wages during the latter part of the year, the Net Income available for fixed charges was \$31,463,336, or but \$720,695 less than the total fixed interest and other charges of \$32,184,031 accruing during the year.

The total taxes accrued in 1937 aggregated \$11,216,077, an increase over 1936 of \$720,208. Freight revenue for 1937 was \$147,212,330 or \$604,588 less than for 1936, this decrease being caused largely by the almost unprecedented decline in business activity during the last half of 1937. Passenger revenue for 1937 was \$11,918,602, an increase over 1936 of \$735,660, or 6.58%.

CONDENSED STATEMENT OF OPERATING RESULTS

Railway Operating Revenues:	1937	Comparison with 1936	
		Increase	Decrease
From Freight	\$147,212,330	.....	\$ 604,588
From Passenger	11,918,602	\$ 735,660	.....
From All Other Sources	10,305,504	312,683	.....
Total	\$169,436,436	\$ 443,755	.....
Railway Operating Expenses	128,859,516	5,259,183	.....
Net Railway Operating Revenue ..	\$ 40,576,920	.....	\$4,815,428
Deduct: Other Operating Charges:			
Railway Tax Accruals	10,918,554	\$ 696,233	.....
Equipment and Joint Facility Rents	4,749,741	.....	234,981
Net Railway Operating Income	\$ 24,908,625	.....	\$5,276,680
Add: Other Income from Investments and Other Sources	6,554,711	.....	691,983
Income Available for Fixed Charges \$	31,463,336	.....	\$5,968,663
Deduct: Fixed Interest and Other Charges	32,184,031	.....	708,993
Income for Year (Deficit)	\$ 720,695	(Decrease)	\$5,259,670

BALANCE SHEET

The balance sheet at December 31, 1937, indicated total property (less accrued depreciation) and other investments, of \$1,087,040,474, and current assets of \$29,987,154 (which include \$12,297,325 for materials and supplies, an increase of \$3,390,386 over 1936), as against current liabilities of \$29,034,104. The total of interest-bearing debt and leased lines obligations outstanding was \$680,862,793 (an increase of \$2,198,151 compared with preceding year). The outstanding capital stock was \$315,158,485, and corporate surplus \$75,839,767.

The Company renews and records its high appreciation of the loyal support and efficient cooperation of all the officers and employees, and solicits the interest of employees and security holders in securing business for the Company.

DANIEL WILLARD, President.

A LOW COST MODERNIZATION SUGGESTION FOR YOUR BOILER PLANT

Higher efficiency, savings in maintenance material, and labor. Increased capacity with present boilers, or higher capacity in less space with new equipment. Constant steam pressure, and ease in holding the volume of steam generated close to load requirements.

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PIPE & FOUNDRY CO.


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HEAVY DUTY	MEDIUM DUTY
Built for more years of service—sizes for any diameter pipe from 12 to 84 inches—any length—tongue and groove or bell end.	Makes same sizes pipe as "Heavy Duty" but built to meet demand for lower cost equipment to produce uniform quality in smaller amounts.
Also manufacturers of concrete pipe machines for making pipe by machine process.	

QUINN WIRE & IRON WORKS 1605 12 St. Boone, Iowa

"Finance and Kindred Subjects"

Bank Deposit Tax

(Continued from page 46)

demands may go as the need for more revenue increases.

The proposal differs from a sales tax, or a consumers tax, or an income tax in that it is a tax on capital, and accordingly would appear to have the immediate definite effect of slowing down activity wherewith to increase the taxable basis in the future.

Government and State Expenditures

On another page reference is made to a new report, "Cost of Government in the United States, 1935-1937," which has just been published by the National Industrial Conference Board. It contains a wealth of information about governmental expenditures, tax collections, national income, government debt, payments by the Federal government to states, industry's tax burden, social security finances, etc.

Picked at random from the survey are the following:

Payments by the Federal government to the states reached a total of \$3,729,000,000 in 1937.

Taxes in 1936 were almost 40 per cent higher than they were in 1933.

The national income in 1923 was nearly \$2,000,000 more than it was in 1936.

The Federal debt has increased 225 per cent since 1930.

In referring to Social Security finances, the Board gives its conclusion—"The entire structure of social security finances is based on the federal credit regardless of the condition of the Federal budget at any given time. It is not necessary to stress that a law that will require investment in government obligations in excess of existing debt will promote extravagance in expenditures."

Baltimore and Ohio Railroad Annual Report

The one hundred and eleventh annual report of the President and Directors to the Stockholders of the Baltimore and Ohio Railroad Company for the year ending December 31, 1937, was recently submitted.

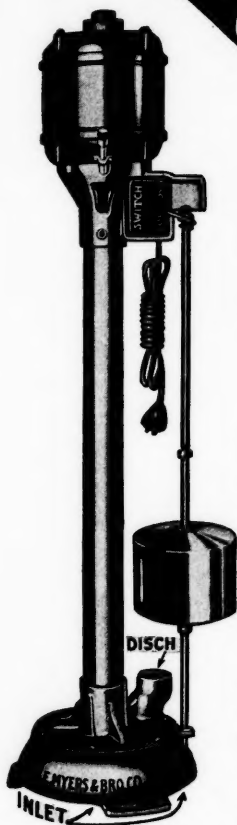
The total operating revenues for the year were \$169,436,436, being an increase over the previous year of \$443,755. This was notwithstanding the termination December 31, 1936 of the emergency increase in freight rates. It is interesting to note as President Willard points out, had these emergency charges been continued during 1937, freight revenues of the company would have been about \$7,000,000 more than they were for the year. Despite this loss in revenue and increases in cost of operation due to higher prices of material and fuel and wage increases during the latter part of the year, the net income available for fixed charges was \$31,463,336, or \$720,695 less than the total fixed interest and other charges accruing.

Taxes in 1937 were \$11,216,077 or an increase over the year previous of \$720,208. Freight revenue was \$604,588 less than in 1936, while passenger revenue was up 6.58 per cent, or an increase of \$735,660.

The total recorded investment in property related to the production of net railway operating income is \$979,940,069, against which accrued depreciation is set up of \$91,015,578. Revenue freight carried during the year amounted to \$5,069,147 tons which was an increase of 3,732,072 tons over the year previous. The President's report points out "that there should have been a decrease in gross freight revenue, notwithstanding the increase in tons carried, is due to the decrease in the average rate per ton per mile, which declined from 9.28 miles in 1936 to 8.74 miles in 1937, the lowest in many years, and reflects the effect of the elimination of the emergency increase in freight rates and charges hereinbefore referred to."

MANUFACTURERS RECORD FOR

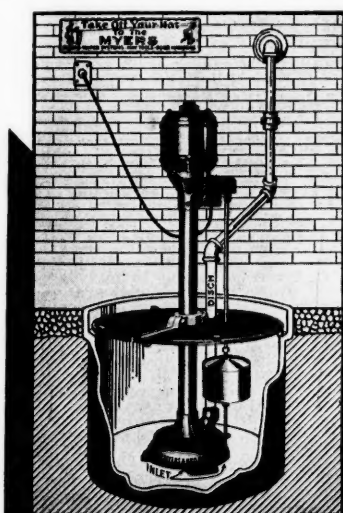
It Drains when it Rains



MYERS CENTRIFUGAL SUMP PUMPS

At the turn of late winter into spring and from then on until summer arrives, flooded cellars and basements are common in most localities. Collectively, loss and damage throughout the country during this period is enormous, so let's not overlook the opportunity Myers Sump Pumps bring to you for profitable business at times like this. More dependable than ever, attractively priced, easy to install and operate, they automatically provide basement or cellar drainage that reduces excessive moisture or flood hazards to a minimum.

Thousands in service — there's no longer any question about their superior performance values. Already the demand is heavy. Write for catalog and information.



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The few perforations illustrated are indicative of the wide variety of our line—we can perforate almost any size perforation in any kind of metal or material required. Send us your specifications.

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Erdle will send samples on request, or if you have a special problem to meet Erdle will offer you the accumulated information resulting from 57 long, full years in the perforating field.

ERDLE PERFORATING CO.
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INDUSTRIAL NEWS

Jones and Laughlin Wire Rope Plant

Jones & Laughlin Steel Corporation, Pittsburgh, Pa., announces the completion of a modern wire rope plant at Muncy, Pa., as an additional unit of its expansion and development program. It will be known as the Gilmore Wire Rope Division of the Jones & Laughlin Steel Corporation and will be under the supervision of Robert Gilmore, General Manager, Muncy. Completion of the new unit marks the entry of the corporation into a new line of finished products, including wire rope for oil country use, for general construction purposes and for industrial application.

Tin Plate and Steel Shipments From Birmingham

The Birmingham plants of the Tennessee Coal, Iron and Railroad Company recently made a shipment of 4000 tons of tin plate and 2700 tons of miscellaneous steel products to Mobile where it was loaded on the Isthmian Line ship, *Steel Inventor*, bound for the Pacific Coast. The tin plate was consigned to American Can Company for its factories at Sacramento, Oakland, San Jose and Los Angeles, California; Portland, Oregon, and Seattle, Washington. The miscellaneous steel products were consigned to Columbia Steel Company at San Francisco.

Strand Distributor for Northwest

N. A. Strand and Company, Chicago, Ill., manufacturers of High Quality Flexible Shafts, Machines and Attachments, announce the appointment of Campbell Hardware and Supply Company of Seattle, Washington, as exclusive distributors for the State of Washington. Substantial stocks of Strand products will be carried by the Campbell organization for prompt service to the trade in the Northwest.

Connecticut Flower Appointments

General Manager Charles H. Keeney, Connecticut Flower Company, Hartford, Conn., announces the appointment of two additional sales engineers, one of whom is Arthur Polston of Louisville, for handling sales exclusively in Kentucky. Julius Lamparzyk of Cleveland, Ohio, will handle sales in that state. Both have had wide practical and technical experience in the flower line.

Republic Rubber Appointment

The Republic Rubber Division, Lee Rubber and Tire Corporation, Youngstown, Ohio, announces the appointment of the Moore Dry Kiln Company, Jacksonville, Fla., as distributors of Republic mechanical rubber products. Through stock and serving facilities, the Moore Dry Kiln Company is in an exceptional position to serve its territory with these products.

New ARMO Appointments

Charles R. Hook, president of The American Rolling Mill Company, Middletown, Ohio, announces the election of Calvin Verity as Executive Vice President and General Manager, and W. W. Sebald as Vice President and Assistant General Manager of the company. Mr. Verity, a graduate of Cornell University, has had wide experience as a laborer, foreman, department superintendent, and in the executive branch of the company in the 27 years he has been a member of the ARMO organization. Mr. Sebald has been with the organization since 1906 and for several years has been ARMO's vice president in charge of commercial activities.

Benjamin F. Curtis Dies

One of the best known traffic men in the East, Benjamin F. Curtis, 69, traffic manager of Norton Company of Worcester, Mass., for fifty years, died suddenly on June 10. Mr. Curtis joined the Norton Company in 1887, two years after its founding, and retired in 1937. He was a former president and a charter member of the New England Traffic Men's Association, beside holding membership in other organizations.

Orders for Koppers Gate Valves

Orders for a total of 206 gate valves have been placed by the cities of Chicago and New

York with the Koppers Company's Western Gas Division, Fort Wayne, Ind. From there, the New York department of water supply, was and electricity will be provided with 166 12-inch valves, and the Chicago department of public works with 30 24-inch and 10 36-inch valves. Each city will furnish specifications for the construction of its valves.

Schuler Joins Republic Steel

Republic Steel Corporation, Youngstown, Ohio, announces the addition of R. J. Schuler to its general sales organization in the capacity of General Sales Representative of Union Drawn Steel Division.

Wheeling Steel Corporation Appoints Brooks

Wheeling Steel Corporation of Wheeling, W. Va., announces the appointment of William Wiley Brooks as district sales manager for the Atlanta territory, with offices in the Healey Building, Atlanta, Ga. Identified for many years with the C. Vance Iron and Steel Company of Chattanooga, Tenn., Mr. Brooks is well known throughout the South.

Economical Steam Generation South

Under the caption of "Economical Steam Generation in the South," the Detroit Stoker Company of Detroit, Mich., is distributing an attractively illustrated booklet outlining advantages of the Detroit Stoker and showing some of its many Southern applications. These stokers are used extensively for economical steam production in plants of all types and sizes, increasing boiler capacities and showing larger returns on investment in steam generating equipment. They provide a most economical and satisfactory method of steam generation, with savings in some instances as high as 40 per cent when used to replace other firing methods. The booklet shows more than fifty prominent plants and buildings, in which Detroit stokers have been installed, and may be had upon request to the company or its branch offices. Southern district offices of the Detroit Stoker Company are in the Johnston Building, Charlotte, N. C.; P. O. Strubling, Jr., District Manager; Title Building, Atlanta, Ga.; E. L. Shuff, District Manager; American Building, Richmond, Va.; 4452 Duncan Avenue, St. Louis, Mo.; and Bond Building, Washington, D. C.

TRADE LITERATURE

CONVERTIBLE SLIP RING MOTORS—

Bulletin M-2—"P&H Convertible Slip Ring Motors," illustrated, presenting an analysis of the requirements demanded of the standard wound rotor type of slip ring motor including specific information as to how P&H Motors are designed and manufactured. Harnischfeger Corporation, Milwaukee, Wis.

ELESKO ECONOMIZERS—

Catalog—illustrating and describing the latest designs and details of Elesko fin-tube economizers, which are of two general designs—Type A in which the ends of the bifurcated tubes are connected by bends with flanged connections, and Type C in which forged return bends are employed. Combustion Engineering Company, Inc., New York, N. Y.

REFRACATORIES—

Folder—"Super-Duty Brick for Super-Duty Service", pointing out factors which led to the development of ALAMO and YARNON, two super-brands of refractories which are declared to be superior to high-heat duty fireclay brick in every important physical and chemical property. Harbison-Walker Refractories Company, Pittsburgh, Pa.

TIMKEN QUALITY TUBING—

Booklet—illustrated, covering in detail numerous and varied industrial applications of Timken Quality Tubing, latest addition to the Tyerson stock of Certified Steels, including physical property specifications, tolerance charts, numerical equivalent tables and other data.

Joseph T. Ryerson & Son, Inc., Chicago, Ill.

COLD DRAWN STEELS—

Handbook—"Cutting Costs With Cold Drawn Steel," illustrated, presenting non-technical discussion of results of cold drawing and their utilization in the manufacture of steel parts. Republic Steel Corporation, Union Drawn Steel Division, Massillon, Ohio.

ENGINEERING MANUAL—

Book—No. 400 Scully-Jones Standard High Production Engineering Manual, embodying new features, one of which is a picture index consisting of 8 pages of halftones of clearly marked with the catalog name, style number of the tool, and page on which it is shown. Scully-Jones & Company, 1901 South Rockwell St., Chicago, Ill.

POWER FOR COTTON GINS—

Booklet—illustrated, "International Power Units for Cotton Gins," International Harvester Company, Inc., Chicago, Ill.

REPUBLIC SOUTHERN FENCE, ETC.—

Catalog—illustrated, printed in four colors, devoted to Republic Southern Fence and other steel products for the farm. Republic Steel Corporation, Cleveland, Ohio.

COMPRESSORS—

Bulletins Nos. 322 and 323—devoted, respectively, to Cooper-Bessemer Type G-MS Compressor Unit, 40 to 50 horsepower and convertible from gas to oil fuel, and to the Cooper-Bessemer Type G-MV Two-Cycle Compressor. The Cooper-Bessemer Corporation, Mt. Vernon, Ohio.

TIMKEN TUBING—RYERSON SERVICE—

Booklet—illustrated, telling about Timken-Ryerson Cooperation, in which Timken Tubing, made by the Timken Roller Bearing Company of Canton, Ohio, is included in stocks of Ryerson Certified steels. Joseph T. Ryerson & Son, Inc., Chicago, Ill.

AIR EJECTORS—

Leaflet—illustrating and describing steam jet air ejectors designed for air removal, condensation, dehydration, deodorization, distillation, evaporation and impregnation—discussing different types, where and when to use them, and outstanding features. Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

CONTROLLING BOILER WATER LEVEL—

Bulletin 413—"Controlling Boiler Water Level on Combined Utility and Sugar Plant Load," a paper by J. H. Dunlap, Plant Superintendent of Fort Bend Utilities Company, Sugar Land, Tex.; published by permission of Mr. Dunlap by the manufacturers of the Copes System of Boiler Feed Control used in the Fort Bend Utilities Company plant; copies from—Northern Equipment Company, Erie, Pa.

BOOK REVIEW—

American Wool Handbook—by Werner von Bergen and Herbert R. Mautersberger. First Edition. 864 pages, 5½ inches by 7½ inches. Illustrated. Published by American Wool \$3.95 per copy in the United States and Handbook Company, New York City. Price Canada, \$4.75 in other countries. Written in simple English, the book presents up-to-date information concerning the growing of wool, its marketing, grading and use in the woolen and worsted trade. It is, in fact, a reference work, reflecting primarily American technique and the practical art of converting wool into yarns and fabrics. Both of its authors are practical textile men, Mr. von Bergen having served for many years as chief chemist of the Forstmann Woolen Company of Passaic, N. J., and has been teaching wool manufacture at Columbia University, while Mr. Mautersberger, a graduate of Lowell Textile Institute, is the technical editor of a leading trade journal and for the past fourteen years has been in charge of evening textile courses at Columbia University. The preface was written by Arthur Besse, president of the National Association of Wool Manufacturers.

Harnischfeger Produces 10,000th Crane

An event of significant importance occurred on the afternoon of June 22 in the plant of the Harnischfeger Corporation, Milwaukee, Wis., when the 10,000th P&H crane produced by the company was inspected and accepted by the buyer. The unit is a 40-ton 100-foot span P&H crane, equipped with a 10-ton auxiliary hoist. A plate bearing the number of the crane was affixed by Ben Van Horn, sales manager of the P&H Crane Division.



DEAR MR. COMMISSIONER,
THERE IS A FAST STREAM NEAR OUR PLACE THAT
MY DAD HELPED DAM UP WHEN HE WAS LITTLE FOR
THE SWIMMING HOLE WE HAVE ALWAYS SWUM IN.
NOW WE CAN'T SWIM THERE ANY MORE BECAUSE DR.
HALLEY THE HELTH INSPECTOR TOLD OUR PARENTS
AT THE MEETING WE'D GET SICK. CAN YOU PLEASE
DO SOMETHING ABOUT IT QUICK?
YOURS TRULY,
BOB HENDERSON

P.S. WE LIVE AT MOUNTLY

SOLVAY SALES CORPORATION

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MANUFACTURED BY
THE SOLVAY PROCESS COMPANY

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PHILADELPHIA, PA.
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Dear Mr. Commissioner:

Liquid Chlorine, the great purifier, can do "some-
thing" about Bob's problem, as it is already doing
something about it in sewage treatment plants all
over the country. Just be sure that the effluent
that flows from your plant is doubly purified with
Solvay Liquid Chlorine.

Very truly yours,

Solvay Sales Corporation

P. S. Solvay Liquid Chlorine should also be used
for treating the water in public swimming pools in
your district.

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for Screening, Grad-
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any industrial pur-
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of many beautiful
designs.

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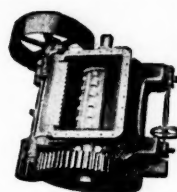
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PERFORATED METALS Screens . . . Grilles

Extensive facilities and long experience make
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metals . . . screen plate with any shape open-
ing, round, square, hexagonal, squarround,*
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grilles of every description. Hendrick can fur-
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metal.
*Reg. U. S. Pat. Off.

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44 Dundaff Street, Carbondale, Pa.
Manufacturers of Mitco Open Steel Flooring, Mitco
Shur-Site Treads and Mitco Armorgrids.

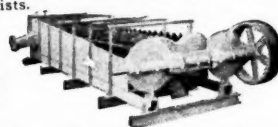


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elevators, conveyors, dryers, jigs,
hoists.

SCREENS

Complete portable, semi-
portable and stationary
crushing, screening and
washing plants for different
capacities of any materials.



McLanahan & Stone Corp.

Established 1835
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LINK-BELT CHAINS - SPROCKETS ANTI-FRICTION PILLOW BLOCKS POWER TRANSMISSION EQUIPMENT ELEVATORS AND CONVEYORS

LINK-BELT COMPANY

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Atlanta, 1116 Murphy Ave., S. W.

Baltimore Dallas New Orleans Offices in Principal Cities

Texas Citrus Industry Sets New Record

BY

Jack H. Drake

*Ass. Sec., Rio Grande Valley
Citrus Exchange*

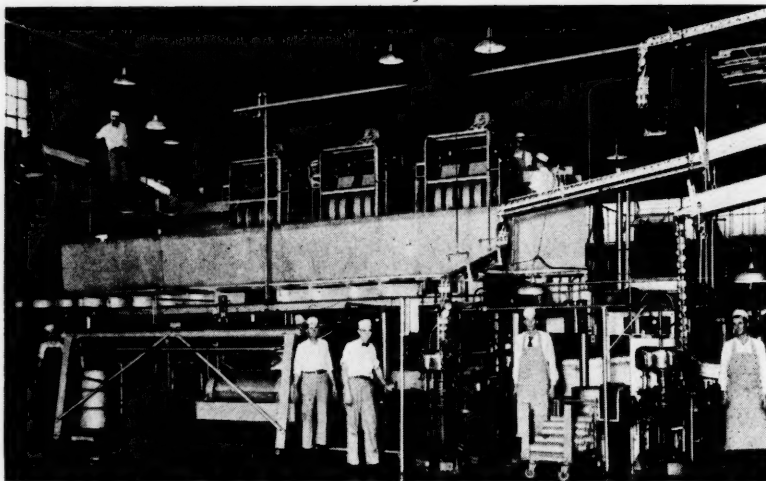
THE citrus crop this year will be the largest one marketed in the history of this Texas industry. Its size and value are indicated by the figures released by the Growers' Industry Committee of Texas which represents the citrus producers. Because so many industries are represented under the general heading of citrus, it is impossible to gauge all of the production figures exactly, therefore, several are estimated. The citrus fruits covered include grapefruit, oranges, lemons and tangerines.

During the shipping season ending on April 30th last, there were marketed this year 11,997,579 standard boxes of grapefruit compared with the revised estimate of last year's movement of 10,000,000 standard boxes. There were 1,261,000 boxes of oranges sold from Texas groves. No figures are yet available on the number of tangerines and lemons that have been or will be moved.

From the figures available, which are substantially correct, it has been estimated that \$2.25 delivered is the average price paid on grapefruit which went into the fresh fruit market, and approximately 6,800,000 boxes of grapefruit were sold in this way during the last year realizing \$15,300,000 total income from this particular source. Of that amount approximately \$4,000,000, in round figures, were returned to the Texas citrus producers, the difference representing money spent on freight, boxes and packing costs.

The general average for the orange movement this year from Texas indicates a net return on trees of \$20.00 per ton or a delivered price of \$2.50 for a standard box. 1,288,000 boxes of oranges were put into fresh fruit channels and 12,000 were processed, which brought in an approximate revenue of \$3,220,000. The Texas citrus industry processed almost 5,000,000 cases of grapefruit juice and segments. Assuming the general average to be 65 cents per dozen number two cans (two dozen to a case) there is an estimated return here of \$6,500,000.

The 1937-38 season showed a net increase of \$9,474,466 over the 1936-37 season with an increase of approximately 18 per cent in the amount of fruit handled this year compared with last. Cooperative marketing has received the credit for



*Interior of the largest grapefruit juice canning plant
which has a daily capacity of 16,000 cases*

the success thus far attained by the Texas citrus industry.

In addition to the fresh fruit, the canned hearts and citrus juices, there is an important by-product comparatively new on the market which is dehydrated citrus pulp and is used for cattle feed. It is made from the peel, pulp and seed of the grapefruit and oranges after the juice has been extracted. It is estimated that this new by-product will bring in another \$1,500,000 in revenue to cover the costs of manufacturing, bags, twine, freight and incidentals, bringing the annual value of the Texas citrus industry to approximately \$27,770,000 which is as closely as it may be estimated.

An important grower organization is the Rio Grande Valley Citrus Exchange which is operated on a cooperative basis and comprises 22 member organizations which have an aggregate membership of 3,212 growers who represent in excess of 50,000 acres of the choicest citrus producing land in the fertile lower Rio Grande Valley.

According to a report given by the United States Bureau of Entomology and Plant Quarantine, 7,040,946 citrus trees were planted in the Rio Grande Valley during the 1937-38 season and census figures reveal that there has been a marked increase of orange and tangerine plants during the past year. The figures also indicate the relative number of the grapefruit and orange trees, total plantings of oranges being about 29.6 percent of the total grapefruit plantings.

Yes—the Texas citrus industry grows!

The Story of Koppers

The story of an industrial organization which in 24 years has grown to become a producer of products for nearly every type of industry in the nation, is told for the first time in "Koppers Yearbook—1938," which has just been published.

Primarily a processor of coal, the book states, the company performs all of the numerous operations necessary to obtain coke, coke oven gas, tar, light oils, and chemicals which it and other industries convert into almost countless products.

The book also describes the Company in the light of a taxpayer and employer.

Total company figures for 1937 have been divided as though each of its 10,029 employees were in business for himself, with his proportionate share of the company's capital, sales, operating expense and payroll.

The working capital of each individual, provided by himself or borrowed, would be \$11,493. He would sell products, render services and receive investment returns totaling \$6,685. Of this he would spend \$4,181 for raw materials, supplies and other operating expenses. His tax bill would be \$181. He would have \$178 for plant and machinery replacement. His share for wages paid to himself for one year would be \$1,561. There would be \$584 remaining for interest on his investment and on the money he borrowed, as well as to provide for expansion.

Taxes paid by the Company in 1937 were 75 per cent greater than the total amount received by stockholders.

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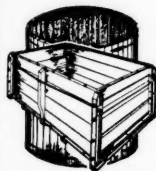
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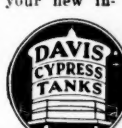


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This applies to field as well as shop built equipment

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CHATTANOOGA, TENN.
TANKS

Our Ample Petroleum Resources

(Continued from page 21)

ferent refining processes. These almost constantly are undergoing changes and improvement. So rapid is progress that the most modern plant can become obsolete in five years.

The refining process known as "cracking" has functioned so effectively in the conservation of petroleum resources as practically to cut in half the volume of crude oil needed in any one year to meet consumer demand for refined products. It is estimated that since 1920 this process has conserved more than nine billion barrels of crude oil.

Comparatively recent, but also comparatively general, has been the adoption of two supplementary refining processes, polymerization and solvent refining. In polymerization the gases released when crude oil is disintegrated by cracking are rejoined to form additional products, notably motor fuel which is blended with the cracked product both to increase the supply and to improve the quality. Solvent refining, used in the manufacture of lubricants, tends to make possible the production of high grade lubricating oils from a wider variety of crude oils. This serves the ends of conservation by putting to superior use both a wider range and a greater quantity of crudes.

Recovery of high-grade motor fuels from natural gas, by polymerization and other processes, reduce neither the availability nor the usefulness of that product, but greatly augment the nation's gasoline supply without drawing upon crude oil reserves. Production of carbon black, and other products, affords practical uses for natural gas produced when oil is brought to the surface.

Petroleum research is making it possible to obtain a greater amount of useful work from refined products. This trend reduces the quantity of raw material needed. Improvements in the quality and utility value of lubricants have been outstanding in the past decade. Higher octane ratings for motor fuels increase the power of internal combustion motors without increasing consumption.

While the petroleum industry has been making such progress in improving producing and refining methods, it has not lost sight of the possibility of developing substitute sources of supply when, as, and if these become necessary. This may come as a surprise to many who have been led to believe, by the publicity given to the utilization of substitutes in countries not favored with a large domestic supply of petroleum, that progress in this field has been more rapid abroad than in the United States.

Petroleum technologists have given the American people, and the American petroleum industry, every assurance that

whenever it becomes economically feasible it will be possible fully to utilize as substitute sources of supply the virtually unlimited coal and oil shale deposits in the United States. Assurance further is given that the change will be accomplished with such little difficulty and at such small cost that the average consumer never may become acutely aware of it.

These predictions scarcely are in accord with those of the prophets of disaster, and rather discount fears of dollar-a-gallon gasoline. Yet, processes now known and in use can produce adequate supplies of refined products as no substantial, if any, increase in cost. These substitute sources are so voluminous as to permit measurement of potential production in billions of barrels.

For these, and other reasons, no need is seen for immediate, or even serious, consideration of the suggestion that motor fuel be made from hopelessly limited and excessively expensive substitutes produced from the soil. Aside from unsatisfactory service, already experienced wherever use of such products is compulsory—and compulsory use of such fuels has been made a favorite political promotion scheme in foreign countries—technologists dislike to rely upon the fickle productiveness of the soil, depletion of which already is a problem in itself.

Those who have warned against impending exhaustion of petroleum reserves invariably have overlooked highly important factors, among them the persistence and ingenuity of American industry which have protected the American people from even a temporary shortage of petroleum and its products since the American industry was founded in 1859. Barring unforeseen events, such as changes in political economy which might force the American public to become largely dependent upon political expediency, instead of industrial progress, there is no reason to look for any abrupt termination of that service.

It was only a few years ago that men were saying the petroleum industry would be a temporary undertaking, because the supply of oil was limited. It was even fewer years ago that men were boasting they would "drink all the oil produced west of the Ohio River." And it is only a matter of months since statements were made in Washington, D. C., in effect that the last oil well would yield the last drop in November, 1941.

Meanwhile the petroleum industry is seeking improved ways and means to locate oil in the billions of acres of favorable geological formation as yet unprospected. It is trying to increase the maximum recovery from every oil pool. It is endeavoring to wrest every last drop of utility value from every product. And it is wondering how to ride out a flood of

production pending the time when Americans shall need more oil than currently they are consuming.

Railroads Spend Millions in Florida Annually

(Continued from page 31)

Essential as railway transportation is, it is but one of several major contributions which the railroads are making to the wellbeing of Florida and its citizens.

The railroads are great industries in themselves. They normally consume one-fifth of the nation's output of lumber, and Florida's foremost industry, aside from agriculture, is the production of forest products. Annual purchases of the railroads for cross ties, poles, piling and sawed lumber in Florida bulk large in the aggregate, and this has the effect of providing employment to thousands of Florida workers. These purchases are not confined to the railroads operating in Florida; many railroads in other parts of the country are among the buyers; and Florida yellow pine and cypress lumber are extensively used in bridge and trestle building and car construction in many parts of the country.

The railway market for forest products fluctuates with the rise and fall of railway earnings. When earnings are good, railroads buy heavily to catch up on maintenance and to make needed improvements. When earnings are unsatisfactory, as at present, expenditures are sharply curtailed, and the forest industries in Florida and elsewhere feel the adverse effect of their absence from the market.

Forest products are by no means the only items on the railway shopping list in Florida. Railway dining cars, serving more than 25,000,000 meals annually in the United States, are heavy consumers of Florida fruits, vegetables and seafoods. Florida-made cigars are sold in dining cars and depot restaurants throughout the country. Hundreds of thousands of dollars are being spent annually by the railroads in Florida for such items as foundry products, paints, chemicals, metal products, ballast materials, cement, tools, electrical goods, laundry service, electricity, water, ice, stationery and printing, office supplies, telephone service, advertising, and so on.

The widespread distribution of railway purchases in Florida is indicated by the fact that some, but not all, of the railroads reported that in 1937 they purchased materials and supplies in 323 cities and towns in sixty-four of the state's sixty-seven counties. Their expenditures in Florida for materials and supplies last year, when railway buying was unusually light, amounted to \$3,853,000, not including expenditures for miscellaneous items such as water, electricity, ice, telephone

(Continued on page 56)

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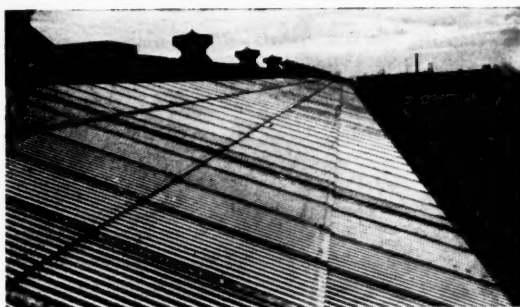
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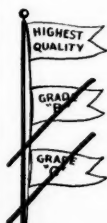
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Railroads Spend Millions in Florida Annually

(Continued from page 56)

service and advertising.

In a canvass of 100 of the leading railway companies in the United States, it was found that fifty-one of them made purchases in Florida in 1937, and only five of this number operate mileage in the state. One Eastern railroad reported purchases in fifty-five Florida cities and towns.

As employers of labor, the railroads outrank every other industrial group in Florida. In 1937 their forces in the state totaled 13,200. With their families, they comprise a group equal to the population of St. Augustine, Fernandina, Fort Pierce, Fort Lauderdale, Kissimmee, Ocala, Arcadia and Bartow combined. Thousands of these railway employees are home-owners and tax-payers and rank among the prominent citizens of the communities in which they live.

Flowing regularly and continuously into the channels of trade throughout Florida are the paychecks for this large army of railway employees. Railway payroll expenditures in Florida last year totaled more than \$19,000,000.

Out of every dollar taken in by the railroads, approximately 45 cents is paid out in wages. Employment and payrolls rise and fall with railway earnings, and in many cities and towns where railroads employ large numbers of workers, railway employment is a barometer of local prosperity.

Still another outstanding railway contribution is the taxes they pay. Railroads are taxpayers in sixty-six of the state's sixty-seven counties. Taxes paid by the eight Class I railroads in Florida (i.e., railroads with annual gross revenues of more than a million dollars) totaled \$2,980,000 in 1937. Based upon the latest analysis of railway taxes, approximately three-fifths of the railway tax dollar in Florida goes to the general support of state and local governments and to highway and bridge construction and maintenance, while the remaining two-fifths goes to support the public schools. It is estimated that railway taxes allocated to schools in Florida are sufficient to defray the public cost of educating around 18,500 Florida children.

Thus, the railroads which played such an important part in Florida development are still vital forces in the state's economy. They are contributing, day in and day out, to Florida's progress and prosperity. Their investments far exceed those of any other enterprise in the state. Their varied transportation services, their extensive purchases, their large payrolls and taxes in cities, towns and communities throughout the state, are highly important factors in Florida's business

activity. Their preservation in full vigor is essential to the progress of the state.

In recent years the railroads have met with severe reverses. The depression, plus inroads of competing forms of transportation, the increasing burden of taxation, high costs of operation, and the business recession have reduced their earnings, impaired their credit, and compelled them to reduce forces, abandon least essential operations, skimp on their

purchases and postpone needed improvements. Despite their best efforts, many railroads have been forced into receivership.

The situation is bringing the American people to realize that the railway problem is their problem. The railroads are such basic factors in American life that the restoration of their employing and purchasing power is absolutely essential to business recovery.

SOUTHERN STATES RESOURCE MAPS

IN COLORS, appearing monthly in MANUFACTURERS RECORD with a two-page statement of resources, present state of development and opportunities for investment and locations for appropriate new industries or branch plants.

Starting with May 1938 issue, the series is scheduled subject to change, as follows:

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JULY FLORIDA
AUGUST GEORGIA
SEPTEMBER . . KENTUCKY
OCTOBER . . . LOUISIANA
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1939

JANUARY . . . MISSOURI
FEBRUARY . . NORTH CAROLINA
MARCH OKLAHOMA
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MAY TENNESSEE
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The value, importance and pertinence of these maps and articles may be appreciated from widespread comments as follows:

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R. W. LECHE
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Research on Prevention of Stream Pollution

In the iron and steel industry an important problem is to prevent stream pollution by waste liquors from such operations as pickling, in which metal is commonly acid-treated. This industry, after endeavoring to solve this problem for many years at heavy expense, has recently founded, through the American Iron and Steel Institute, a fellowship at Mellon Institute of Industrial Research in Pittsburgh, with the aim of attempting a definite solution as soon as possible. According to the Mellon Institute, this investigation will be car-

ried on until concluded to the satisfaction of health and industrial authorities. It will be the objective to treat or process the waste liquor of pickling plants so as to render it entirely safe for discharging into streams, recovering from it chemicals from which useful products can be made economically. Thousands of tons of iron and sulfuric acid are now wasted annually in various districts of this country by the lack of a suitable method of treatment, especially a procedure that can be employed on the large scale necessary in big mills; and a concerted effort will be made to take out the chemicals in solution in the liquor by a satisfactory procedure and to discover uses for them.

Willard W. Hodge, professor of chemical engineering and head of the Department of Chemical Engineering at West Virginia University, and also director of the Engineering Experiment Station of that institution, will head this investigational work at Mellon Institute. He is well known as a specialist on the recovery of by-products from industrial wastes, proper disposal of trade effluents, water purification, and control of stream pollution, and has contributed to the literature of municipal water supplies, waste liquors from by-products of coke plants, treatment of paper mill and tannery wastes, water treatment from the chemical engineering standpoint, disposal of ammonia liquor containing phenols, coal seams and their drainage, and effects of coal mine drainage on water supplies.

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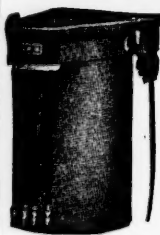
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